2017

DESIGN AND IMPLEMENTATION OF AN ORIENTATION TO ONLINE LEARNING MINI COURSE WITH UNDERGRADUATE AND GRADUATE STUDENTS WITH VARYING LEVELS OF ONLINE COURSE EXPERIENCE

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Digital Object Identifier: https://doi.org/10.13023/ETD.2017.008

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DISSERTATION

A dissertation submitted in partial fulfillment of the
requirements for the degree of Doctor of Education in the
College of Education
at the University of Kentucky

By
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Lexington, KY

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2017

ABSTRACT OF DISSERTATION

DESIGN AND IMPLEMENTATION OF AN ORIENTATION TO ONLINE LEARNING MINI COURSE WITH UNDERGRADUATE AND GRADUATE STUDENTS WITH VARYING LEVELS OF ONLINE COURSE EXPERIENCE

This case study examined the implementation of an orientation to online learning mini-course that introduced the learning management system (LMS) and the support services available for online learning students involved in undergraduate and graduate coursework. The purpose of the mini-course was to address issues with online course attrition related to students' technology preparation and skills described in the literature (Bozarth, Chapman, and LaMonica, 2004; Dupin-Bryant, 2004). The course design featured elements of Keller's (1968) Personalized Systems of Instruction and Bloom's Mastery Learning (Guskey, 1997), specifically, student demonstration of unit mastery, monitored by the instructor, and the use of correctives. Sixty-five (65) undergraduate and graduate students took the mini-course concurrently with required for-credit coursework. Using implementation science as a conceptual lens (Greenhalgh, Robert, McFarlane, Bate & Kyriakidou, 2004) the research focused on students' interaction with the mini-course design features and documented the implementation process on multiple levels of a user system: system readiness, adoption/assimilation, end-user implementation and consequences. Demographic data, scores from technology skills surveys and an assistance needs questionnaire were analyzed along with data from student emails and course evaluations with open-ended questions.

Perhaps the most unanticipated finding was the lack of system readiness to test and integrate a research-based orientation course that, given the attrition rates among students with varying levels of course experience, is needed to support students' effective participation in online coursework. Serious issues regarding system readiness to implement the mini-course included a lack of support resources to incorporate the mini-course within existing coursework systems. Across several institutions, and with positive responses to the need for online course orientation, administrators were unable to clearly commit and schedule a course that would cost neither the student nor the institution and was customized to their institution's LMS. Access was negotiated at the course/instructor level only. Readiness issues then affected motivations for the adoption and assimilation of the mini-course.

At the system level of implementation, a more comprehensive strategy to obtain institutional buy-in to facilitate implementation is needed. At the end-user level of implementation, participants with varying levels of experience responded differently to the various skill options. Frustrations with a mastery approach was reported, in particular wait times for instructor response needed to proceed. And while many reported the course was not useful for them, but would be for new students, they clearly needed the skills related to software navigation, hardware and internet communication tools and competencies. Future design of the orientation course needs to include 1) multiple versions to accommodate students' *perceptions* of their needs, 2) direct feedback on skill levels to promote acceptability and 3) more automated instructor response features. The limited number of freshman and students new to online coursework did not support conclusions about the utility of such a course to address attrition among those groups.

KEYWORDS: Online Course Attrition, Online Orientation Course, Implementation Science, Mastery Learning, Personalized Systems of Instruction

Heather E. Arrowsmith

November 30, 2016
Date

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November 30, 2016

DEDICATION

To my Mom, who, while shopping at the Marshall University Bookstore shortly before graduating with my Bachelor's degree, pointed to the doctoral gowns and said, you will have one of those one day. I will always be very grateful for her vision for me and her belief in me. In addition, I can't thank her enough for the hours she put into watching my daughter, especially in the last few months writing.

To my Dad, who was always there to bounce ideas off of and encourage me when I most needed it. Witnessing the value he places on education, experience, hard work, and treating people with integrity have shaped who I am and what I value.

To my husband, who met me while I was writing my research proposal, has never known me as anything other than a doctoral candidate. His support and patience with me while I complete this important endeavor is much appreciated.

To my daughter, Anna, while only two, will not remember the many hours she spent at Grandma's and Grandpa's while I was at home writing, or the visits she made with me to campus, but nevertheless was an enormous motivation to finish this degree.

ACKNOWLEDGEMENTS

I would like to express my deepest appreciate for Dr. Mazur, my mentor and committee chair. She has been my advisor for nearly 13 years and has supported me through a Master's Thesis and now a Doctoral Dissertation. Her guidance, wisdom, and support through a variety of research and employment opportunities and life changes has also earned her the title of my "UK Mom." Dr. Mazur has always been supportive of letting me explore research topics of interest to me. The breadth of knowledge she possesses and her ability to put theory into practice set a great example for me and I hope to be as accomplished one day. I will never be able to express all the ways she has influenced me, so lastly, her optimism even in the complex and frustrating situations has always provided me with the strength to continue moving forward, even when the path was uncertain. It has been an honor to work with her.

I would also like to thank my committee members, Dr. Gary Anglin, Dr. Kelly Bradley, and Dr. Gerry Swan. They have not just been committee members, but influential professors and mentors who have shaped my research interest and methods, and have encouraged me to think bigger when I wasn't sure I was ready. I am grateful that each agreed to participate on my committee.

I would also like to thank my outside reviewer, Dr. Richard Ingram for agreeing to sit on my committee. Your participation is most appreciated.

I would like to thank the University of Kentucky Graduate School and the School of Arts and Sciences for the Graduate Assistant position that covered the cost of my tuition. Not only did I greatly enjoy the work I did in the Online Education department but without this, I am certain I could not have afforded the time or resources to complete this degree.

Many other colleagues, teachers, professors, friends, and family members, through conversations, often long before pursuing this degree was even a consideration, have given me the strength and determination to complete achieve great things, one of which was this degree.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Chapter 1-Introduction

This dissertation research is a case study that includes both quantitative and qualitative components. In order to address the serious problem of attrition in online courses, the researcher developed and implemented a web-based Introduction to Online Learning orientation mini-course to prepare potentially at-risk distance education students. This course was developed using a combination of research-based elements borrowed from Personalized Systems of Instruction and Mastery Learning frameworks (Keller, 1968; Bloom, 1968). The orientation course was delivered using the Learning Management Systems (LMS) such as Blackboard or Canvas in use at the study subjects' post-secondary institutions. Quantitative data were gathered through pre-test and posttest measures and an initial demographic survey. The qualitative component focused on an analysis of requests for assistance from students taking the course as well as their reactions to specific elements of the course. In this introduction, I provide an overview of the problem and the research questions that frame the study.

Statement of the Problem

Institutions of higher education, both private and public, have been experiencing increases in online course enrollment over the last decade. In the Fall 2014 semester, about 28% of students took at least some of their courses online (Allen, Seaman, Poulin, & Straut, 2016, p. 12). From the Fall 2012-Fall 2014, distance education enrollments grew by 7% (p.13). In the fall of 2014, of the 5.8 million students who took online courses, 2.85 million took all of their courses online whereas 2.97 million took some of their courses online (pp.11-12). All these enrollment gains were obtained, while overall college and university enrollment has decreased (p. 13).

Unfortunately, while online course enrollment is increasing, colleges and universities are reporting a higher rate of attrition in online courses as compared to traditional face-to-face classes. A study conducted by Aragon & Johnson (2008) examined completers and non-completers in online courses. They found completers attempted more online credit hours than non-completers and completers had a higher GPA than non-completers. (p. 150). In this same study, the researchers interviewed students who dropped out of online courses. The most frequently reported reasons for dropping out of online courses were personal reasons and time, the "course design and communication" practices, technology issues, institutional issues, and a lack of accommodations for students' learning preferences (pp.151-152). Thus, while online courses are reaching a demographic that may not have previously had access to a higher education, these students are not as likely to persist and succeed throughout the course as students taking face-to-face courses.

One characteristic that attracts students to online classes is the flexibility of completing coursework in a location and at a time convenient for them. This flexibility is particularly attractive to students with family and work obligations (Kolowich, 2010). Earning a degree can be difficult when faced with the demands of work and family. The flexibility of online classes makes it easier for the students who face these demands to gain access to higher education. Not surprisingly, those who are married, have dependents, or work full-time are more likely to take distance education courses than those who are unmarried or without dependents (Radford, 2011, p. 12). During the 2007-2008 school year "29% of students with one or more dependents and 32% of married students took a distance education class in contrast to 18% of students without these

characteristics" (p. 12). A larger percentage of undergraduate students age 30 years and older (53%) are enrolled in take distance education programs than younger students (47%) but when reviewing the entire population of all who take distance education courses, students age 23 and younger still make up the largest percent of distance education students (44.2%) (p. 11).

Enrollment in online classes is increasing; however, the attrition rates in these courses are higher than in face-to-face classes. Community colleges, in particular, are most affected by higher attrition rates in online courses, often 20% higher than in the face-to-face version of the course (Aragon & Johnson, 2008, p. 146). Although the purpose of online classes is to make education more accessible, in reality, the barriers of course design as it relates to communication and instructional practices as well as technology and institutional issues prevent students from successfully completing these courses. Surveys of students who have dropped online courses indicate many of these reasons: the course took too much time, technology was a barrier, student support services were lacking and learning preferences were not considered in the course design (Aragon & Johnson, 2008, pp. 151–152). While research exists on students' motivation and affect towards online courses and why students drop out, there are few studies on the role or impact of the instructional design of online orientation courses designed to prepare students for online learning.

Distance education, originally known as "correspondence study" has been available for 'off-site' students for over 170 years (Keegan, 1996, p. 7). With advances in synchronous and asynchronous technologies over the last few decades, online courses have generally become more engaging. However, more improvements are needed.

Instructional designers can address online design issues and improve elements of the courses that may lead to increased retention rates in online courses. These instructional design elements could affect communication practices, student engagement, course-pacing, and technology skills and awareness, all identified as contributors to student dissatisfaction and attrition in distance education coursework.

Description of the Research

After reviewing the study findings of Aragon & Johnson (2008) on why students fail to successfully complete online courses, the researcher developed a study in hopes of addressing some of most common issues students reported. Eighty percent of students reported personal time, course design and communication, or technology as the reason they did not complete the course (Aragon & Johnson, 2008, pp. 151–152). Most of these issues can be addressed by the institution. Improving the instructional design of online courses using learner centered, evidence-based methods and the implementation of an orientation to online learning course would seem well within the scope of the institution's influence. Although the institution cannot change the demands on their students' personal time, it can help the students and their advisors better assess whether or not a particular student is a good candidate for online learning.

Implementation Science: What Effects Implementation?

In addition to finding better ways to assess students to determine whether or not they are good candidates for online learning, colleges and universities can better prepare students for online learning by implementing a mandatory research-based online orientation course. Adapting the Greenhalgh, Robert, MacFarlane, Bate and Kyriakidou (2004) User Systems model to the educational institution provides a framework to

determine the characteristics colleges and universities need to have in order to successfully implement a course and initiate lasting change. This model also reveals the barriers that prevent successful implementation of an orientation course at the institutional level.

Students' Perseverance of Long-Term Goals.

Another innovation that might be coupled with the implementation of an online orientation course would be better assessments of students' dispositions for success in these courses. One such assessment that might have promise to assess these demands and the likelihood of persisting in an online course is the GRIT scale developed by Duckworth, Peterson, Matthews & Kelly (2007). The combination of providing an orientation to online learning combined with useful assessment data on persistence may increase retention in online courses and help improve the online course experience for the learner.

Instructional Design

Research identifies two systems of learning, Fred Keller's Personalized Systems of Instruction (PSI) and Benjamin Bloom's Mastery Learning (ML), developed in the 1960's by these prominent psychologists, include some of the same elements that are the focus of today's *Next Generation Learning Challenges* initiative ("Next Generation Learning Challenges," 2012). As outlined in Guskey (1997, pp. 15–16), both models focus on the importance of feedback and correctives and mastery of content, all prominent components of *Next Generation Learning*. PSI and ML resulted in higher student achievement scores in the traditional classroom, but there is little research measuring the success of these approaches in online courses (C. C. Kulik, Kulik, &

Bangert-Drowns, 1990; J. A. Kulik, Kulik, & Cohen, 1979). In fact, the elements of instruction that made these two systems unique have not been routinely included as elements of mainstream online instruction. Since the elements that are unique to these two models are currently receiving national attention in *Next Generation* education reforms, and online education enrollments are increasing, it seems worthwhile to revisit these models to research their effectiveness in the online environment.

Currently, 20% of all undergraduate students enrolled in public or private institutions of higher education and 24% of all students enrolled in community colleges need to take remedial courses prior to enrolling in college-level courses (Sparks & Malkus, 2013, pp. 2–3). These additional courses increase the amount of time students spend in college as well as the cost of their tuition, and some students find themselves repeating remedial courses. In fact, according to a report commissioned by Complete College America (Johnson, 2011, p. 1) more than 60% of students who graduate with a bachelor's degree take more than four years to do so. Unfortunately, the statistics for community college students are not more optimistic. More than three quarters of community college students take more than two years to complete an associate's degree (p. 1). In the Fall 2009, 13 million students were enrolled in community colleges nationwide, representing 44% of all undergraduates and 43% of all freshmen ("Community College Fact Sheet," 2012). Moreover, of this population in community colleges, 42% of the students are first-generation college students ("Community College Fact Sheet," 2012). The combination of a large body of many first generation students, students who need remedial courses, and students who have other external commitments already, make successful course and degree completion difficult. These factors, coupled

with high attrition rates in the online classes offered by colleges and universities, makes this a crucial time to find better ways to design courses to support student success and learning. By identifying barriers to successfully completing classes, especially those offered online, the design community can address those barriers and increase retention rates for incoming freshmen or for any students new to online coursework and learning.

Orientation to Online Learning

In addition to the careful consideration of the instructional design of a course, research supports at a minimum offering, if not requiring, all new online students complete an online learning orientation course (Bozarth, Chapman, & LaMonica, 2004; Dupin-Bryant, 2004). However, there seems to be little information and very few courses offered to students to help them prepare for being successful in online classes. In fact, many student misconceptions linger about how online courses work. In particular, many students still believe online courses require less time and work than face-to-face classes (Dereshiwsky, 2005). Any instructors or students familiar with online classes often find the opposite to be a more accurate assessment of online coursework.

An orientation class may be important to students' success in both the classroom and workplace, as research indicates technology barriers, course design and communication account for 46% of the reasons students did not complete their online course (Aragon & Johnson, 2008, p. 153). Dupin-Bryant (2004) found that "students who have adequate computer training in relevant technologies are more likely to complete online courses since the computer technologies are less likely to impede the learning process" (p. 204). In addition, Bozarth, Chapman, and LaMonica (2004) found a disconnect in students' and faculty's expectations about students' technical competencies,

the amount of time students should devote to the course, and the level of interaction between faculty and students and among students. These researchers also recommended the creation of a mandatory orientation course for all students planning to take an online course. Based on their surveys and feedback of students and faculty, they created an outline of competencies they thought would be important for the new online learner (p. 98). Using this information, along with recommendations from the faculty at the university that participated in this study, the researcher was able to develop a 0 credit hour *Introduction to Online Learning* mini-course. Those students who participated in the study took this introductory to online learning course during the first few weeks of their for-credit online course. Below is the course description:

The course provides an opportunity for students to practice using Blackboard/Canvas and other relevant online learning technologies to complete course requirements and prepare for the technology-rich classroom.

Figure 1.1 *Introduction to Online Learning course description.*

A Closer Look at Attrition in Online Courses: What Makes a Difference?

Although the intent of this course is to help prepare students by enhancing the technology skills and understanding of the expectations to be successful in the 21st century college classroom, technology skills alone do not guarantee success. Considering the reasons that Aragon & Johnson (2008) note in their online course drop-outs research, I began looking for learner dispositions that might characterize their experiences. For example, a primary reason for withdrawing was 'personal reasons and time', which accounts for 34% of the responses students gave for why they did not complete their

online course (p. 151). What, then, compelling reasons existed that accounted for those students who successfully completed their course and program in *spite* of personal pressures (Aragon & Johnson, 2008, p. 153)? Intrinsic motivators can have a powerful effect on learning so I wanted to explore factors that might apply to the online student. Pachnowski and Jurczyk (2000) explored the use of the Self-Directed Learning Readiness Scale and determined it was not a good predictor of student success in online courses (p. 15). I closely evaluated the *Need for Cognition* scale (Cacioppo & Petty, 1982), but in the end decided upon a scale that focused on perseverance rather than the need for learning. The GRIT scale, created by Duckworth, Peterson, Matthews, and Kelly (2007) measures GRIT as "perseverance and passion for long-term goals" (p. 1087). Their first 12-item scale was designed to answer the question "why do some individuals accomplish more than others of equal intelligence"(p. 1087). Of importance to this study is that the GRIT scale is not positively correlated to IQ (p. 1098). Instead, one distinguishing feature of gritty individuals is their ability to "set for themselves extremely long-term objectives and do not swerve from them-even in the absence of positive feedback" (p. 1089). It seems dispositions such as perseverance and grit would be particularly helpful to students taking online classes where communication with the instructor and classmates vary in type and frequency and where external motivators may be limited or non-existent. Duckworth and Quinn (2009) later developed and validated a shorter, 8-item version of the GRIT scale. It is this scale that I employed in this dissertation study.

The goal of this study was to

- understand the post-secondary students' technology knowledge and skills

- learn how adaptable post-secondary institutions are to implementing a research-based innovation
- understand how students perceive the *Introduction to Online Learning* mini-course.

Research Questions

The overarching question that framed this study was how do the design and implementation outcomes of an orientation to online learning course address issues related to students' technology preparation, skills and student support services for undergraduate and graduate students with varying degrees of online experience? The specific sub-questions addressed were:

How do students' skills and needs match with the content of the course?

How adaptable was the existing institutional online education system to integrating an orientation to online learning mini-course?

How do students with previous experience perceive the orientation to online learning mini-course?

Dissertation Outline

Chapter 2 includes a review of literature of Personalized Systems of Instruction and Mastery Learning, preparing students for online learning, the GRIT scale, and gaps in the research. In Chapter 3, I describe the case study research methodology used in this study, including evaluating students' request for assistance, perceptions of the value of the Introduction to Online Learning course, individual GRIT scale values, and pre-test/ posttest measure data.

Chapter 2-Conceptual Framework and Relevant Literature

Relevant Literature

The field of education is continuously influenced by new initiatives, reform acts, promising research, and technologies. Organizations such as the Bill and Melinda Gates Foundation, the William and Flora Hewlett Foundation, the Council of Chief State School Officers, Educause, International Association of K-12 Online Learning, and the League for Innovation in the Community College are interested in education and have joined together to support the *Next Generation Learning Challenges* initiative. This initiative specifically outlines five guiding principles to improve college readiness. These include the widespread implementation of technology-rich educational systems that utilize evidence-based methods to support student learning. Among these evidence-based methods is mastery learning ("Next Generation Learning Challenges," 2012).

Mastery Learning is not new to the field of education. Two well-known instructional systems that implement a mastery-style of learning include Fred Keller's Personalized System of Instruction (PSI) and Benjamin Bloom's Mastery Learning (Guskey, 1997; Keller, 1968). Much research was conducted on these two systems in the 1970 and 1980s. The results of these studies are noteworthy. Any new research in the area of mastery learning is not complete without reference to both models. Kulik, Kulik, and Cohen (1979) conducted a meta-analysis of 75 comparative studies and concluded "PSI generally produces superior student achievement, less variation in achievement, and higher student ratings in college courses, but does not affect course withdrawal or student study time in these courses"(p. 307). An analysis of 36 research studies of Bloom's Learning for Mastery (LFM) found 94% of these studies determined the treatment group

experienced favorable results and the majority of these studies (71%) were statistically significant (C. C. Kulik et al., 1990).

With time, both approaches have waned in popularity. Not only have the number of research studies about PSI and ML dwindled, so have the number of classrooms using these approaches (Buskist, Cush, & DeGrandpre, 1991). Keller admitted his approach could be costly and time consuming but today the resources available to both the student and the instructor are very different (Keller, 1985). Perhaps mastery learning models are viable and feasible approaches for the technology-rich 21st century next generation learning.

Attrition and Retention in Colleges and Universities

While society and funders are pushing for personalized, technology-rich learning experiences the reality is, colleges and universities struggle with retention. Not only do very few students graduate with a bachelor's degree in four years, but many students taking online courses struggle to complete them. Early educational conversations about online education focused on whether students taking online courses were getting equivalent learning opportunities as compared to those taking face-to-face (f2f) classes. Now the focus has shifted to the higher attrition rates in online courses as compared to f2f courses. Many students, especially non-traditional students, are attracted to online courses because of the perceived flexibility these courses offer for those faced with work and family demands. Unfortunately, more often the result is a higher attrition rate than the equivalent face to face class. In community college online courses, the attrition rate can be up to 20% higher than in the equivalent face-to-face courses (Breslin, 2001). A 2010 study of the non-returning students at one four year university indicated the top four

reasons students left the college were reasons pertaining to personal, academic, financial or adjusting to the college/campus environment (University of Kentucky Institutional Brief, 2010). While one might argue that personal, financial, and adjustment issues are difficult to address in the instructional design of a course, it is also possible to note that for online students, the campus environment IS the online context and might be addressed through instructional design. Other issues identified by Aragon and Johnson (2008) as reasons students drop out of courses can be addressed by instructional design: "course design and communication practices," technology issues, institutional issues, and the lack of accommodations for students' learning preferences (p. 151). Rovai (2003) integrated existing persistence models and research about the skills and characteristics of distance education students to create a model designed to help distance education administrators identify students who are at risk of dropping out of their online course. Included in this model are factors such as student characteristics and skills *prior* to admission, as well as external and internal factors *after* admission. Particularly relevant to this proposed study are the internal and external factors *after* admission. Rovai referred to Tinto (1975) and Bean and Metzner (1985) for information on the difference between internal and external factors Rovai used. In this study, external factors that help to identify whether a student is at risk for dropping out include non-school related variables such as family and organizational support related to financial problems, hours of employment, time constraints and outside encouragement (p. 10). It appears internal factors include variables internal to the individual but also the school. For example, while self-esteem is a factor in this model, so are the clarity of the online programs, policies, and procedures, information about the schools' e-learning system and personnel (including instructors,

advisors, technicians) social integration through interpersonal relationships, and access to student support services (pp. 10-11). Park and Choi (2009) suggested that course and instructional design strategies that make the course interesting, relevant and keep learners engaged could help diminish the impact of both external and internal issues.

Three Pronged Study Focus

The research base for this study reflects a three-pronged approach to my development of a theoretical and conceptual lens for the study. First, I researched evidence-based instructional strategies that I thought would adapt well to the online environment. During this process I discovered Fred Keller's Personalized Systems of Instruction and Benjamin Bloom's Learning for Mastery (now referred to as Mastery Learning) (Bloom, 1968; Guskey, 1997; Keller, 1968). Second, during my research on attrition in online courses, I found research supporting the need for an orientation course for new online learners. In this study I was able to integrate the research-based instructional design principles into an orientation course I created for new online learners. The third prong of my research focused on the value of using the GRIT scale to help students and their advisors identify whether or not the student is a good candidate for online learning.

Instructional Design

Early interest in instructional design research can be traced back to the training demands of World War II and the lack of significant research in the field of psychology up to that point (Dick, 1987, pp. 183–184). While little research was being conducted in the psychology field at the universities, the Air Force established their own research centers, the American Institutes for Research, with the intent, among other things, to

effectively train a variety of their service members (p. 184). This early research paved the way for Skinner's programmed instruction in the 1950's and other prominent researchers in the decades to follow to make advances in educational psychology (p. 184) for application in the military and workplace training as well as P-20 classroom learning.

Unfortunately, whether due to lack of time, resources, or research, too often online courses do not reflect the many instructional advances that have been made in education. Online courses are sometimes referred to as an "information dump". That is, files upon files are just uploaded without providing the learner any context in which to read or process the information. Although the method of delivery is different, evidence-based research can still inform the design of an online course. For this study I explored two instructional design systems, Fred Keller's Personalized Systems of Instruction and Benjamin Bloom's Mastery Learning (Bloom, 1968; Keller, 1968).

Personalized Systems of Instruction.

Keller spent most of his professional career as a Professor of Psychology at Columbia Universi ty. During this time he was instrumental in developing reinforcement theory, which later became the foundation for the development of the Personalized System of Instruction ("Distinguished contribution for applications in psychology," 1977). By "maximizing rewards for educational behavior, minimizing chances for extinction and frustration, eliminating punishment and fear and facilitating the development of precise discriminations," Keller and Sherman (1974) felt they were creating a better learning environment (p. 52). They identified five essential components of PSI: (a)"the go-at-your-own-pace feature," (b) "the unit-perfection requirement for advance," (c) "the use of lectures and demonstrations as vehicles of motivation rather

than sources of critical information," (d)"the related stress upon the written word in teacher-student communication" and (e)"the use of proctors which permits repeated testing, immediate scoring, tutoring, and a marked enhancement of the personal-social aspect of the educational process" (Buskist et al., 1991, pp. 216–217).

Go-at-your-own-pace / self-pacing.

John B. Carroll (as cited in Guskey, 1997) suggested that all students have the ability to learn, even master content, but the time they require to do so (learning rate) varies. The "go-at your own pace feature" (self-pacing) allows students the opportunity to take unit tests and quizzes when they feel confident they have mastered the content. This component allows more time for students who need it to be successful but also allows those students who can progress faster the option to finish their course earlier. This prevents those students who are usually forced to progress to the next unit before they have mastered the content from doing so before they are ready. Meanwhile those who are more advanced can progress forward rather than waiting for others to catch up (Buskist et al., 1991).

Unit mastery / mastery learning.

Although PSI is considered self-paced, students do not determine when to advance to the next unit, rather their pacing is dictated by when they demonstrate mastery of the content. The units are small and include a few manageable main points and ideas. The professor determines the level at which mastery is achieved, but usually it is defined as correctly answering 80-95% of the unit quiz questions. Typically, quiz questions are multiple choice, fill-in-the-blank or short-answer but Keller did not exclude essay style

questions from being used just as long as students were tested on "each and every major unit objective" (Buskist et al., 1991; Keller & Sherman, 1974, p. 31).

If the student does not satisfactorily meet the requirements for mastery on their first attempt, they are required to retake the unit quiz until they master it. "There is no 'cost' assigned to retaking quizzes; students are not punished for making several attempts at mastering the unit" (Buskist et al., 1991, p. 217). In addition, this no cost/no punishment benefit helps to reduce the chances of exhaustion, frustration, fear, and punishment (Keller & Sherman, 1974).

Study guide.

Students using the PSI methods primarily study the material on their own without the guidance of the instructor in the lecture format. As a result, Keller & Sherman (1974) recommend instructors prepare a study guide for each unit in order to help the student identify the important material in each unit as well as help the student evaluate when they adequately understand the material and can successfully take the quiz. They suggest the study guide includes an introduction section, statement of objectives, study questions, and procedures for accomplishing unit objectives (Keller & Sherman, 1974).

Introduction.

The introduction is where the instructor provides written directions to students for how to approach the reading materials. Some strategies include warning the students of incorrect or outdated sections of the text, providing a summary of the unit, and making connections between previous material and the new material (Keller & Sherman, 1974).

Statement of objectives.

This section of the study guide identifies the behaviors for success. The statement of objectives lists what the students must be able to do after reading the material and identifies all of the material that will be on the unit tests (Keller & Sherman, 1974).

Study questions.

The instructor can develop study questions to help students make connections between the objectives and content or to help the students identify when they have mastered the content and are ready to take the unit quiz. Study questions and test questions should not be identical but they should refer to the same content (Keller & Sherman, 1974).

Procedure.

The procedure section guides the students through the material. It should "tell the student what to do, how to self-test his/her comprehension, how to decide whether to proceed or review, and how to decide when he/she has finished" (Keller & Sherman, 1974, p. 31).

Lectures and demonstrations as motivation.

Lectures serve as a device for motivation in a PSI class. The purpose of the lecture is not to present new content, rather it is a method used to motivate the learner. These 20-30 minute lectures can occur up to ten times a semester and provide an opportunity for students to see the professor at his/her best, talking about the type of research in which he/she is involved. Only students who have completed a predetermined number of units may attend the optional lecture. If the lecture truly is

inspiring, this is additional reinforcement for students to keep working towards unit completion (Keller, 1968).

Emphasis on the written word.

Another component of Keller's PSI model was an emphasis on the written word. Students gain exposure to the content primarily by reading text. Students respond in writing both on the study guide and on the quizzes. Sherman and Keller approved of other forms or delivery such as audio and visual material delivered through audio devices, computers, and television, but only if readily available, affordable, and reliable (Keller, 1968; Keller & Sherman, 1974)

Use of proctors.

The proctor is instrumental in a PSI class. The proctor is usually an undergraduate student who has previously taken and excelled in this same undergraduate course. The trained proctor is an agent of reinforcement. He/she is equipped with detailed answer keys, provides immediate feedback on quizzes, opportunities for clarification of incorrect answers, and individual tutoring (Keller & Sherman, 1974). Equally important is the proctor's social purpose. Having already taken the same course, the proctor can identify with the current students, fostering a close, individualized relationship (Buskist et al., 1991).

Additional Research on PSI

Many measures were used to calculate the effectiveness of PSI in the research. Student GPA, pre-test/posttest, final examination performance, surveys and questionnaires of student opinions, withdrawal rates, and course grades were the most commonly used measurements. These study designs were primarily quantitative. Even

those studies that used questionnaires still analyzed the data using quantitative measures. Only four studies had a qualitative component (Austin & Gilbert, 1973; S. G. Clark, 1974; Hobbs, 1981; Pear & Crone-Todd, 1999). The majority of the quantitative studies used final grades and final exam scores to compare student performance of students in PSI courses to those in traditional courses. Some of the study designs were quasi-experimental, but most studies did not disclose how students were assigned to each treatment. In the studies that did report this, there was a mixture of both treatment assignment based on course enrollment and self-selection.

The studies that replicated Keller's original study using a strict interpretation of his five components, found statistically significant results in the favor of the PSI treatment (Blasingame, 1977; Callahan & Smith, 1990; Hoberock, Koen, Roth, & Wagner, 1972; Koen, 2005; McMichael & Corey, 1969). One study found no significant results but only used the PSI method for three weeks during the semester (Jumpeter, 1985).

The research on Computer Assisted Personalized Systems of Instruction (CAPSI) was limited. In the studies that were reviewed, the computer was only used to help deliver the quizzes, exams, manage scores, and assign proctors (Brothen & Wambach, 1999; Martin, Pear, & Martin, 2002a, 2002b, Pear & Crone-Todd, 1999, 2002; Pear & Novak, 1996). One study did use WebCT to provide immediate feedback to students taking the exams and unit quizzes on the computer (Chase & Houmanfar, 2009). Only two studies researched web-based PSI. These studies implemented technology to deliver the unit content (Eppler & Ironsmith, 2004; Rae & Samuels, 2011). None of the studies used technology to facilitate discussion or communication.

Robin (1976) reviewed 39 between-group comparisons of behavioral instruction, loosely modeled on Keller's PSI model and lecture-discussion methods. He specifically reviewed outcome comparisons and analyzed the contribution and importance of each of Keller's five components to the entire PSI model. Thirty of the 39 studies found "significant differences in favor of behavioral instruction" (p. 320). He made the following conclusion in his review of the components:

- self-pacing can lead to procrastination (p.330)
- oral testing produces equivalent achievement results (p.333)
- proctoring is essential to higher student achievement and course completion rates (p. 337)
- behavioral objectives contribute to achievement and (p. 343)
- more research is needed regarding unit length and testing frequency (p. 339)

Robin also determined lectures were only a reinforcer when the lecturer provided exam questions or points towards the final grade for attending the lecture. In addition, he found that self-monitoring and no-monitoring models may contribute to a stronger internal locus of control compared to proctor-monitoring. He suggested more research is needed to determine the effect of short unit length, self-pacing, and optional lectures (p. 343).

Taveggia (1976) evaluated fourteen studies which included 28 independent comparisons to determine if "college students taught by PSI learned more than college students taught in a more conventional manner" (p. 1028). All of these studies compared student performance on examinations. He concluded "the Personalized Systems of

Instruction has proven superior to the conventional teaching methods with which it has been compared"(p. 1029). In addition, Taveggia attributes three of the five components of Keller's PSI model to its success: unit-mastery, self-pacing, and proctors (p. 1030). The age demographics of these students were not identified in the studies. Most of the classes were introductory courses and unlikely to include many non-traditional students. Further research would be needed to determine whether this is an appropriate approach for students enrolled in a community college, the majority of whom are non-traditional students. Kulik, Kulik, & Cohen (1979) published a meta-analysis of 75 comparative studies in order to answer three questions 1) "How effective is PSI in the typical comparative study?", 2) "Is PSI especially effective for certain types of students or on certain measures of instructional effectiveness?", and 3) "Under what conditions can PSI be shown to be especially effective?"(p. 309). Based on my research, Kulik, Kulik, & Cohen (1979) were the first to calculate statistical significance and effect size. Forty-eight of the 61 studies measuring achievement determined by final examination performance, found a statistically significant difference in favor of the PSI method over the conventional method. In addition, a medium effect size of .49 in favor of the PSI groups over the conventional groups was calculated (p. 311).

These three literature reviews and meta-analyses represent the favorable outcomes that many experienced. There are still unanswered questions about the cost effectiveness of PSI, whether it can be adapted to other learning environments such as online courses, and how technological improvements could aid the delivery of a more efficient and effective form of PSI.

Mastery Learning

Another well-known instructional model considered for this study was Mastery Learning. In the 1960's Benjamin Bloom, Professor of Education at the University of Chicago, and father of Mastery Learning, proposed that "given sufficient time and appropriate instruction" nearly all students could attain mastery (Guskey, 1997, p. 5). The premise of Mastery Learning goes back to John B. Carroll's position that aptitude was a reflection of learning rate rather than the traditionally held notion that aptitude was a reflection of the level to which a student could learn (Guskey, 1997). Carroll suggested that "the learner will succeed in learning a given task to the extent that he spends the amount of time that he needs to learn the task"(Carroll, 1963, p. 725). Carroll also suggested perseverance, the opportunity to learn, the quality of instruction and a students' ability to understand the instruction were important elements that determined the degree to which a student learned (Guskey, 1997, p. 4). This approach significantly altered the educational conversation by suggesting that changes to the design of instruction could influence what students could learn.

Recognizing that one-on-one tutoring is the ideal learning environment, Bloom identified the elements of tutoring and looked for ways to implement these elements in a group-based educational environment (Guskey, 1997, pp. 6–7). He identified these elements as small units with frequent checks for learning (formative assessments) and immediate feedback followed by suggestions for correction and remediation and then another opportunity to demonstrate mastery (p. 7). These elements are strikingly similar to those of PSI however, there are a few key differences in the way PSI and ML are implemented. In PSI, students work independently and retake the same assessments until

they achieve mastery, making this method inherently student-paced. Because students work independently, they spend the majority of their time interacting with the materials. The instructor does not deliver the content directly but serves as a guide who clarifies student questions and provides feedback on assessments (Keller, 1972). ML is group-based and the teacher determines the rate at which students progress, making this model teacher-paced, but still learner centered. The teacher delivers the content and students typically have only one opportunity to retest after completing the corrective activities. After the re-test the entire class moves on to the next lesson (Guskey, 1997). Unlike PSI, the correctives in ML are new resource materials the students haven't seen before. The idea is that if the resources they used the first time didn't help them understand the content, then referring students to the same resources is unlikely to help them. Instead, students are provided with new materials that present the same content in a new way.

Ongoing and unanswered issues.

Lecture as motivation.

A key component of PSI is reinforcement. Students needed a motivator in the form of an extrinsic reward to progress though the self-paced course. Keller's solution was to use the lecture as motivation, but none of the studies that were reviewed evaluated whether this was an effective motivator. In fact, the common concern about student procrastination could suggest lectures were not sufficiently motivating to students.

Time to implement.

Originally, the PSI and ML methods, while receiving widespread acknowledgement of their effectiveness took considerable time to implement. PSI

required extensive bookkeeping and ML took more instructional time than the conventional method of teaching (C. C. Kulik et al., 1990, p. 281).

Written word.

The PSI model as originally implemented, relied strongly on the written word. As a result, content distributed on paper was the main delivery method for both study materials and assessments. Keller acknowledged the possibility of using other instructional delivery methods, such as audio and visual material delivered through audio devices, computers, and television, but was concerned about their use as whether they would be readily available, affordable or reliable at the time (Keller, 1968; Keller & Sherman, 1974). Today, technology is far more advanced and available. As enrollment in online courses continues to grow, so does the focus on the educational strategies and success of students taking online classes. More people, foundations, and other institutions are finding same-time, same-rate, same-place models inefficient and undesirable. This concern suggests it is time to rediscover the essential elements of PSI and ML to meet the demands and expectations of the changing student and educational environment.

Possibilities for PSI and ML today.

The PSI method was popular in college classrooms up until the 1980's. At its peak, there was a *Journal of Personalized Instruction,* and a *Center for Personalized Instruction* at Georgetown University (Sherman, 1992). Even though this method repeatedly showed statistically significant learning gains over the traditional instructor-centered style of teaching, was highly praised, and was predicted to inspire educational

reform and the transformation of the teacher's role (Keller, 1968) it lost momentum by the 1980's.

Mastery Learning was equally influential in education and a study by Kulik, Kulik, and Bangert-Drowns (1990) indicated that those in Learning for Mastery (LFM), now called Mastery Learning (ML), experimental treatments had higher final exam scores. In addition, these results were statistically significant (p. 281). Much like PSI, ML is rarely mentioned in today's educational conversations. "Personalized learning" and "competency-based learning" are the popular phrases. Although the terminology has changed, the goals are much the same.

Currently, society is questioning the quality of public education thereby reevaluating our primary instructional methods. The *Next Generation Learning Challenge* is indicative of a significant movement to redesign education to make it more personalized. The *Next Generation Learning Challenge* recognizes the limitations of same-time, same-rate, instructor-centered models of instruction. Students who have different strengths and work at different paces should have opportunities to master content at a developmentally appropriate time (Reigeluth & Carr-Chellman, 2009, p. 15). The self-pacing component of PSI and mastery component of ML achieve this goal.

Additionally, the widespread use of technology could make the delivery method of the content more efficient. Even Keller acknowledged audio and video devices could be used in PSI, but at the time, described these as "luxuries" (Keller, 1968, p. 87). Today, these audio and video technologies are not seen as luxuries but are instead widely integrated into the classroom environment. While technology alone may not improve student learning, when paired with a student-centered, mastery-style learning model,

grounded in the research of PSI and ML, it could lead to an effective and efficient means of educating the 21st century learner (R. E. Clark & Sugrue, 2001, pp. 85–86). Future research is needed to determine the best way to integrate technology into the PSI and ML framework in order to maximize student learning.

Orientation to online learning.

While online courses are increasing in popularity, colleges and universities have made few accommodations to prepare students for this alternative, yet increasingly mainstream, learning environment. To be successful, it is vital the learner understands their computer, the environment in which they have to navigate (LMS and other software, etc.) and can trouble-shoot issues related to each, or at the very least, knows where to get assistance prior to their first for-credit online course. Unfortunately, because technology can be a barrier to successful completion of an online course students who are unprepared for this environment drop out. Dupin-Bryant (2004) looked at six pre-entry variables related to online course retention: "1) cumulative grade point average, 2) class rank, 3) number of previous courses completed online, 4) searching the Internet training 5) operating systems and file management training, and 6) Internet applications training" (p. 199). This study found that those students who did not complete the course "tended to be lower-division students whose cumulative grade point averages were lower than completing students…non-completing students had taken fewer computer training courses than their counterparts" (p. 204). While the number of years of computer experience was not correlated with student completion, computer courses such as 1) searching for information on the Web, 2) operating systems and file management, and 3) Internet applications, were predictors of student completion of

online courses" (p. 204). Therefore Dupin-Bryant concluded "students who have adequate computer training in relevant technologies are more likely to complete online courses since the computer technologies are less likely to impede the learning process" (p. 204).

Dupin-Bryant's research justifies the need for an orientation course while Bozarth, Chapman, and LaMonica (2004) conducted a study designed to identify problem areas students encounter in online learning. Using closed and open-ended feedback from instructors and students via a questionnaire about "technical skills, assumptions about online learning, and challenges of online learning" (p.90) and focus group meetings with instructors, the researchers, identified problem areas in online learning (p. 90). For example "instructors perceive the technology skills deficits as a much bigger problem than do students" (p. 91). In addition, they discovered issues related to the appropriateness of students' communication, both in the method (private/group) and frequency (p. 93) and a misunderstanding of the time commitments required of an online course (p. 97). Specifically, they found students "had the impression that online learning closely resembled correspondence study" and were not anticipating the high level of interactivity required of them (p.101).

While most students in the study reported encountering problems when taking an online course, only 20% said they would take an online learning orientation course (p.96). Bozarth, Chapman, and LaMonica (2004) attribute this resistance to the data that suggests students "assess their skills as much higher than what the instructors are actually witnessing" (p. 102). They suggest making the orientation course mandatory, but making it self-paced so that more advanced students can move through the content

faster than students who need more remediation (p. 102). The researchers identified the following core competencies students should master by the end of the orientation course:

- Locate and use support resources for technical troubleshooting
- Access course web sites
- Navigate a course web site including use of navigational links
- Use e-mail
- Open, close, create and send files
- Manage course assignments and meet deadlines
- Participate in online discussions and synchronous chat
- Complete online test and quizzes as well as complete online assignments (p.101).

While the researchers gathered this data with the intention of creating a 1-credit hour course, I used these competencies as the content framework for the much shorter online orientation course developed for this study.

Diffusion of Innovation

While an important aspect of this study is the Introduction to Online Learning orientation mini-course that is grounded in research-based instructional design, it represents only part of the study. In order for any instructional packages or courses to be successful, they have to be "intentionally implemented" (Rogers, 2002). He addresses this issue in his Diffusion of Innovation model. Rogers defines "diffusion" as the "process through which (1) an innovation (2) is communicated through certain channels (3) over time (4) among the members of a social system" (as cited in Rogers, 2002, p. 990). He outlined five characteristics of an innovation that make it more likely to be adopted: "(1) relative advantage, (2) compatibility, (3) complexity, (4) trialability, and (5)

observability" (p. 990). Rogers warns, however, that because preventative innovations don't illicit immediate/tangible results, but prevent unwanted consequences from possibly occurring in the future, preventative innovations are relatively low in relative advantage, compared to non-preventive innovations and less likely to be adopted (p. 991).

Implementation Science

As the actual implementation of an online orientation course was foundational to this research, as will be further discussed in chapter three, four, and five, an examination of recent theoretical perspectives in implementation science became essential to understanding the case study. Implementation Science was built on the work of and expands Roger's Diffusion of Innovation model. According to Fogarty International Center which is part of the National Institutes of Health, "Implementation science is the study of methods to promote the integration of research findings and evidence into healthcare policy and practice. It seeks to understand the behavior of healthcare professionals and other stakeholders as a key variable in the sustainable uptake, adoption, and implementation of evidence-based interventions" ("Implementation science information and resources," n.d.). While it is most commonly used in the health sciences, its application has been transferred to other fields. Fixsen, Blasé, Naoom, & Wallace (2009) suggest the human services field could also benefit from the science of implementation (p. 531). In addition, a research brief by the Office of Planning, Research, and Evaluation (OPRE) outlines a stage-based framework for using implementation science in early childhood education programs and systems (Office of Planning, Research and Evaluation, 2015). In this study, I used the User System framework from the Greenhalgh, Robert, MacFarlane, Bate and Kyriakidou's (2004)

"Conceptual Model for Considering the Determinants of Diffusion, Dissemination, and Implementation of Innovations in Health Service Delivery and Organization" as a framework to report findings related to implementation. I chose this framework which includes the stages of "system readiness", "adoption/assimilation", "implementation" and "consequences" to report the findings of implementing the Introduction to Online Learning orientation mini-course as the findings may have instructional design implications that can be addressed in further iterations of the course design.

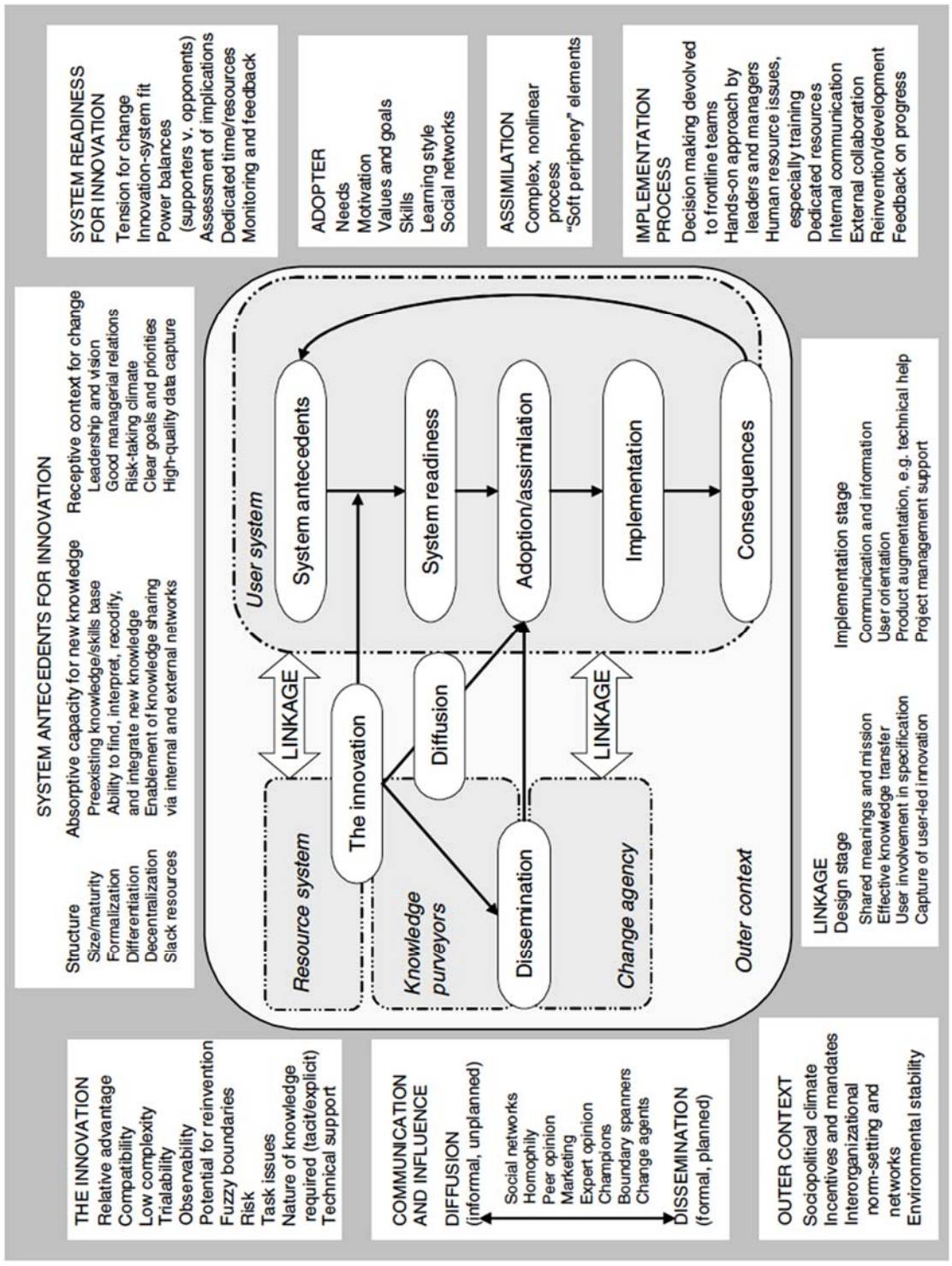


Figure 2.1 from (Greenhalgh et al., 2004, p. 595).

How Implementation Science Informed the Course Design

Not all innovations are adopted and assimilated into an organization. There are a variety of reasons, especially pertaining to the User System, that I examine further in chapters three and four. Greenhalgh et al. (2004) developed a list of key attributes which they deemed necessary in order to increase the likelihood of the adoption of the innovation, in this case the intervention: the orientation to online learning mini-course. By intentionally addressing these attributes during the design phase of the intervention I hoped to expedite the adoption/assimilation process.

Relative advantage.

Greenhalgh et al. (2004) describes relative advantage as a "clear, unambiguous advantage in both effectiveness or cost-effectiveness" (p. 594). This course had the potential to increase retention rates for students enrolled in online courses. Doing so would increase the institution's effectiveness and certainly be more cost-effective for the student. In addition, the course was originally developed at no cost to the institution and later customized at no cost. The designer, who is also an experienced online instructor, was available to teach the course at no cost to the institution or the students.

Compatibility.

Compatibility is the extent to which an innovation is "compatible with the intended adopters' values, norms, and perceived needs"(Greenhalgh et al., 2004, p. 596). Those that are compatible are more likely to be adopted. Student retention is a conversation that is being held on the national scale. When I typed "student retention" into one college's search engine, I received 2110 search results which indicates this topic

is of value to the institution. A course that addresses students' retention is likely to speak to the needs of the institution.

Low complexity.

Innovations that are perceived as less complex are more easily adopted than innovations that are more complex (Greenhalgh et al., 2004, p. 596). While the course was originally designed as a one-credit hour course taken over a 16-week period. Then it was reduced to a non-credit 2-week course and eventually into a mini-course that took about 2-3 hours spread out over a couple days.

Trialability.

Trialability allows system users to use the intervention with a limited number of participants and by doing so, such innovations are adopted and assimilated more easily (Greenhalgh et al., 2004, p. 596). Other than the investment of time on behalf of the designer, the monetary investment in the project was minimal because the course was built using existing/free learning management systems. The course is not a support system in itself, but points the students to existing support systems already in place. As a result, a large trial size was not necessary.

Observability.

When adopters can visibly see the benefits of the innovation, it is more easily adopted (Greenhalgh et al., 2004, p. 596). This may have been the most difficult design issue to address. I was able to demonstrate how the course worked and outline the units and topics the course addressed but the benefits of the course are more difficult to demonstrate in a short period of time and depend largely on student perceptions. This speaks to Roger's (2002) Relative Advantage concerns for preventative innovations.

Reinvention.

"If potential adopters can adapt, refine, or otherwise modify the innovation to suit their own needs, it will be adopted more easily" (Greenhalgh et al., 2004, p. 596). Throughout the process of negotiating access to the user system, I worked with the institutions to build the course in their learning management system, and customize the course content with the institution's support services' information and processes. By customizing the course, I hoped to make it more relevant to the students and also easier for the institution to adopt.

Fuzzy boundaries.

In addition to customizing the content, it is important that the innovation have some flexibility. When there is a "hard core" of the innovation that is the immovable bare minimum and a "soft periphery" that can be adapted to fit within the system the innovation is more likely to be adopted (Greenhalgh et al., 2004, p. 597). In this case, the course objectives were the hard core of the course that guided me as I designed the course but aspects of the course such as the length of the course varied depending on the needs of the institution with which I have worked.

Low risk.

The lower the risk of the innovation as perceived by the adopter, the more likely the innovation will be used and adopted (Greenhalgh et al., 2004, p. 597). This course had no risk and took very little time for the student to complete (total of 2-3 hours). Because the course was built within the institution's LMS and utilized the university's single sign-on system, student information was as secure as it is in a for-credit course.

Task issues.

When an innovation is relevant to the user's work, the more likely it is to be adopted (Greenhalgh et al., 2004, p. 597). This innovation is directly related to students' technology-rich learning environment. This course is relevant to all new students as the number of students enrolling in online courses is growing at a time when the traditional face-to-face course is also becoming a technology-rich environment.

Knowledge required to use it.

When the "knowledge required for the innovation's use can be codified and transferred from one context to another, it will be adopted more easily" (Greenhalgh et al., 2004, p. 597). There are two important aspects of this course: 1) it provides information to the student about how to successfully navigate an online course and access the student support services available and 2) provides an authentic learning experience for students. Not only are students learning about the LMS and the resources available to them but they have to USE the LMS. For students who take this course for the first time, they have the benefit of learning how to navigate in the LMS in a low-risk/practice environment and are not at risk for receiving a low grade for technology barriers they face but are instead, encouraged to retry and refine their skills until they achieve mastery. Once they achieve mastery, they can transfer those skills to their online and technology-rich face to face courses.

Augmentation/Support.

The last key attribute of an innovation that makes it more easily adoptable is the degree to which the innovation is augmented with necessary support services (Greenhalgh et al., 2004, p. 598). In this case, the institution did not have to provide any

support services as the designer was also the instructor for the course and the course was built within both of the university's LMSs (Blackboard and Canvas).

Measuring student's perseverance to predict success in an online course.

Improvements to the instructional design of online courses and requirements that students new to online learning first take an orientation course, will help more students be successful, but there are students for whom online learning is not the best strategy. It would be helpful to identify these students before they drop or fail an online course. Since Pachnowski, and Jurczyk (2000) determined the Self-Directed Learning Readiness Scale is not a good predictor of student success in online courses (p. 15), it is worth exploring other scales. Motivated by the work of William James (as cited in Duckworth, Peterson, Matthews, & Kelly, 2007), particularly his question "Why do some individuals accomplish more than others of equal intelligence?"(p.1087), Duckworkth, Peterson, Matthews and Kelly (2007) suggested that grit, the "perseverance and passion for long-term goals" was what led some people to achieve more than others (pp. 1087-88). They developed a 12 question Likert-style scale that was face valid for adolescents and adults (p. 1090). After conducting six studies with different groups, they found "significant incremental variances in success outcomes over and beyond that explained by IQ" (p. 1098). Shortly after this study was published, Duckworth and Quinn (2009) developed and validated a shorter version of the GRIT scale. This shorter scale had just eight questions and focused on two areas "Consistency of Interest" and "Perseverance of Effort" (p. 172). They found that Perseverance of Effort was a "superior predictor of GPA…" and "Consistency of Interest was a better predictor (inversely) of career

changes among adults" but that "individuals may need both…to succeed in the most demanding domains" (p. 172).

The eight items of the Short GRIT Scale are as follows:

- I often set a goal but later choose to pursue a different one.
- New ideas and projects sometimes distract me from previous ones.
- I have been obsessed with a certain idea or project for a short time but later lost interest.
- I have difficulty maintaining my focus on projects that take more than a few months to complete
- I finish whatever I begin.
- Setbacks don't discourage me.
- I am diligent.
- I am a hard worker (Duckworth & Quinn, 2009, p. 167).

Because Perseverance of Effort was a predictor of GPA, I hypothesized that it might also be a predictor of whether or not a student successfully completes their online class. If so, students and advisors could use this indicator to initiate discussions about whether or not online learning is a good fit for the individual. For undergraduate courses, successful completion is determined by a final grade or an A, B, or C. For graduate courses, successful completion would be a final grade of an A or B.

Online course retention is a complex issue. The research suggests there are a variety of reasons students do not successfully complete their online courses. By better identifying which students have the technology skills and competencies necessary for online learning, as well as the desire to persist, and then better preparing them by

implementing a research-based orientation course, institutions can increase student retention and success in online courses.

Chapter Three, that follows, presents the study design participants, measures, and procedures for data collection and analysis.

Chapter 3-Methodology

This study employs a case study methodology. Specifically, the research design for this study is a single-holistic case study of the implementation of an orientation to online learning mini-course that introduced the learning management system (LMS) and the support services available for undergraduate and graduate students with varying levels of online course experience. According to Yin (2002), a case is "a contemporary phenomenon within its real life context, especially when the boundaries between a phenomenon and context are not clear and the researcher has little control over the phenomenon and context"(p. 13). Robert Stake, another prominent case study researcher describes a case as "the study of the particularity and complexity of a single case, coming to understand its activity within important circumstances"(Stake, 1995, p. xi).

Using Robert Stake's Definition of a Case Study

After a careful review of the different case study designs, I decided that Robert Stake's definition of case studies would align well with an implementation study. Stake's perspective draws from "naturalistic, holistic, ethnographic, phenomenological, and biographic research methods"(p. xi). He further defines a case as a "specific, a complex, functioning thing…a "bounded system"(p. 2). He identifies three types of case studies: "intrinsic", "instrumental" and "collective"(pp. 3–4). Intrinsic case studies are ideal when the researcher "needs to learn about a particular case"(p. 3). An "instrumental case study" is used when there is a "need for general understanding" and the researcher "may get insight into the question by studying a particular case"(p. 3). When a researcher studies more than one case it is considered a "collective case study"(p. 4).

Instrumental Case Study Design of this Study

This study is an instrumental case study of the design and implementation of an orientation to online learning course for undergraduate and graduate students with varying levels of online course experience. It is an instrumental case study because I want to understand more than just this case (the effects of this course with this population of students) and more about the general problem of student attrition and retention in online courses and the process for implementing an orientation to online learning course designed to prepare students for online learning.

Yin (2004) points out that "good case studies benefit from having multiple sources of evidence"(p. 9). This study utilizes both quantitative and qualitative data. Quantitative data were collected from a demographic questionnaire, pretest and posttest data, a technology skills and competency indicator, a student technology needs-assessment, and the GRIT scale. Qualitative sources included student emails requesting assistance with the course, post-course open-ended questions about students' likes and dislikes about the course, and observations about the implementation of the course. Table 3.1 outlines how this study aligns with Robert Stake's Case Study Approach(Stake, 1995; Yazan, 2015).

Table 3.1

Robert Stake's Key Case Study Elements and Application to this Study

Attribute	Robert Stake's Approach	Application to this Study
Robert Stake Case Study	People or program	Orientation to Online Learning Course
Holistic Case Study	"considering the interrelationship between the phenomenon and its contexts" (Yazan, 2015, p. 148)	This is a case of the design and implementation of an orientation to online learning course used with undergraduate and graduate students with varying levels of online experience.
Research Questions	Flexible	• The research questions changed over time. • Had to find out how to "bind the case" (figure out what the bounded system was) • How do the design and implementation outcomes of an orientation to online learning course address issues related to students' technology preparation, skills and student support services for undergraduate and graduate students with varying degrees of online experience?
Gathering Data	Observation Interview Document review	• Researcher's observations of implementation • Student demographic survey • Student technology skills and competency indicator • Student Needs-analysis questionnaire • Student GRIT survey • Student emails • Student open-ended course evaluation data • Pre-test and posttest data

Table 3.1 (Continued)

Analyzing Data	Categorical Aggregation/ Direct Interpretation (Yazan, 2015, p. 149)	• Analysis of students' request for help • Analysis of students' responses to open-ended questions • Identified Themes/Categories
Data Validation: Internal Validity Reliability External Validity	Triangulation: 1) data source 2) investigator 3) theory 4) methodological	Data validation through reviewing and comparing data from multiple sources (questionnaire, student responses, student request for help)

Sample

This course was intended for freshmen and first-time online students, however, given multiple recruitment issues with participants in three other institutions, the participants included both graduate and undergraduate students, most of whom were simultaneously enrolled in an online course, rather than taking the orientation prior to online work. Graduate students made up the largest portion of the sample, representing 69.2% (n=45) whereas undergraduates made up 30.8% (n=20) of the sample and twelve (n=12) of the undergraduates were freshman or sophomores (see Figure 3.1). The ages ranged from 18-61 years.

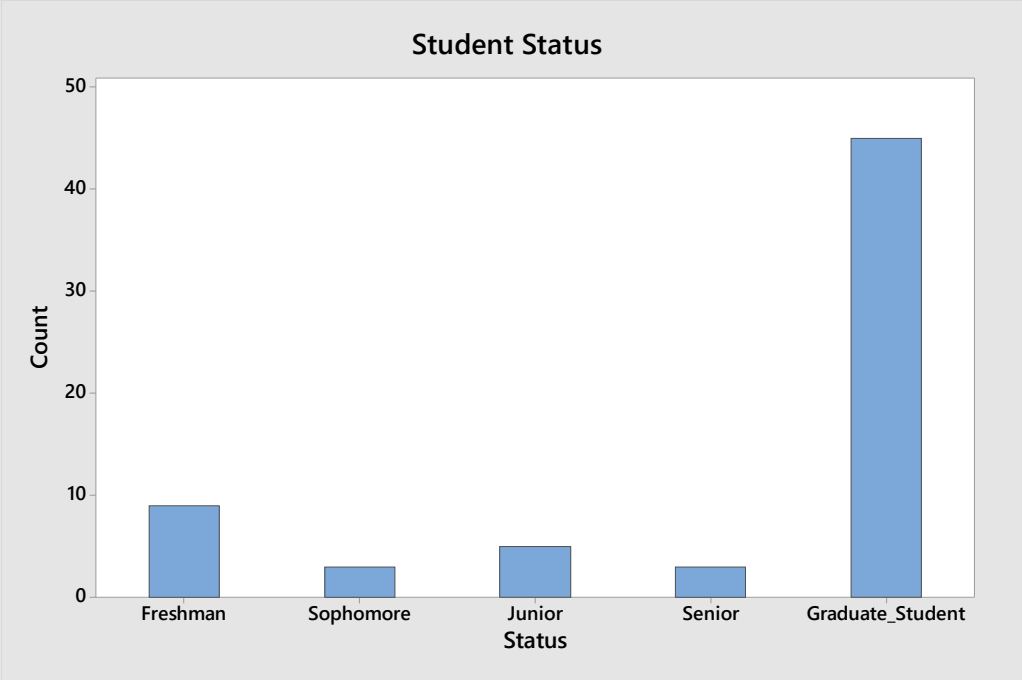


Figure 3.1. Count of students from each class.

Eleven of the 65 participants in this study were enrolled in a freshman 'developmental' face-to-face course. Presumably these students would be taking an online class as part of their upcoming academic work and would therefore benefit from an orientation to online coursework. Seventeen male students, 47 female students and 1 who preferred not to answer, participated in the study.

In addition, the majority of all students participating in the study had taken at least one online courses prior to the semester of the study (73.85%, n=48). However, slightly over one quarter (26.15%, n=17) of the participants had not taken any online courses prior to this semester.

The students who participated in this study were enrolled in a variety of different colleges at the university. See Table 3.2.

Table 3.2

Colleges (areas of study) in which the Students were Enrolled

Colleges	Count of Students
Nursing	4
Health Sciences	3
Engineering	1
Education	43
Design	1
Communications	2
Business	1
Arts & Sciences	5
Agriculture, Food, and Environment	1
Graduate School	4

Setting for the Study: The Post-Secondary Institution

In the Fall 2015 semester, when this study took place, the total enrollment for the post-secondary institution in which all participants were enrolled was 30,720. The largest demographic among the university population were those aged 18-20 (41.8%), followed by 21-23 year-olds (27.7%) and, then, 24-26 year olds (10.7%). Degree seeking students pursuing a bachelor's degree made up the majority of students (n=22,247) (Anonymous, 2015).

The ethnic/racial breakdown of the students enrolled at this institution are the following: White 73.9% (n=22,697), African-American or Black 6.6% (n=2038),

Hispanic or Latino 3.8% (n=1167), Asian 3.0% (n=911) and two or more races 2.8% (n=267), American Indian or Alaska Native 0.2%(n=65) and Native Hawaiian or other Pacific Islander 0.1% (n=29), Unknown Race or Ethnicity 3.4% (1058), and Non-resident Alien 6.1% (1,888) (Anonymous, 2015). The majority of students enrolled at this institution are full-time students (90.8%; n=27,880). Females made up 53.5%(n=16,422) of the student population while males made up 46.5% (n=14,298) (Institution Name Redacted/Student Data-Enrollment).

Those students who leave this particular institution have cited the following main reasons for leaving: Academic (21.2%), Adjustment to College/Campus Environment (14.9%), Financial (17.6%), Personal (46.3%) (Institution Name Redacted/Institutional Brief: Results of the New Student Attrition Survey," 2010).

Additional Information about the Participants, Setting and Timeline for the Study

Initially, I submitted an expedited protocol to the University of Kentucky Institutional Review Board (IRB) to conduct this research study. Minor revisions were submitted and approval was granted under IRB Protocol Number 12-0942-P4S on December 20, 2012. On June 9th, 2015 an Approval of the Modification Request for Protocol 12-0942-P4S was granted by the IRB.

The original institution that was to be the site of the study was the community college system in a Midwest state. The orientation course was actually developed specifically at the request of this institution. However, a high level administration change at that system resulted in a lack of interest in pursuing the implementation of the course in their system during 2013. During the Spring 2014 semester, I went through a major course development change. I designed and developed a new course that would take

students approximately 2 weeks to complete in preparation for a study at Institution 2, in order to tailor the course to their specifications, on the promise that the institution would participate in the study. Unfortunately, for reasons that will be discussed later in the findings, the study was not implemented at Institution 2. So later, after recruiting participants at yet another university, I redeveloped it for this third site, Institution 3. While the course was offered at Institution 3, the limited participation served to confound the conduct of a full study. Lastly, I was granted approval to complete the study at Institution 4, and redeveloped the course, once again, at the request of the institution so that it would take students a total of 3-4 hours to complete, but with several key components retained related to skills noted in the literature that support students' preparation for online coursework.

Prior to the start of the Summer 2015 semester at Institution 4, I met with faculty from the Colleges of Education and Arts and Sciences to get their written consent so that I could engage the students in their Summer 2015 Session I and Session II online classes to participate in the Introduction to Online Learning mini-course. Students were then asked to participate in the online mini-course in the first 1-2 weeks of their summer semester.

The Freshman Orientation Course at Institution 4

Cogent to the present study is that at the final study site (Institution 4) there is offered a Freshman Orientation Course to incoming students. This course signals a commitment to retention and preparation for freshman and an emphasis on student retention currently documented in the Provost's Strategic Plan (citation withheld for anonymity). I wanted to explore the orientation supports available at this institution.

Prior to the start of the Fall 2015 semester, I reached out to additional faculty who were either teaching an online course, were teaching a technology-rich course, or were teaching a Freshmen Orientation course. Students who chose to participate took the course during the Fall 2015 semester. By the Spring of 2016, the data collection process closed and I began the data management phase. Data analysis followed during the Summer 2016 and Fall 2016 semesters.

Institution 4 is a Research 1 university in the southeast who agreed to participate in this study. It offers an introduction to college class to help students with the "transition to university life". There is not an orientation course for online learning. The purpose of the current orientation course is to help new students adjust to academic life at the university (see Figure 3.2). While there may be some attention paid to the technology skills students need to be successful in college and online courses, there is no mention of it in the course description.

> This course is designed to assist undergraduates in adjusting to the academic life of the University. Through lectures, discussions, exercises, and out-of-class assignments, 101 helps first-year students: articulate the purpose and nature of a college education at a research university; articulate [the university's] expectations of its students; gain an appreciation of the University's mission, history, and traditions; develop skills for achieving academic success such as study strategies and library research skills; increase awareness and use of campus resources; reflect on personal and social issues that first-year students often face in a college environment; become involved in the total life of the University; and form beneficial relationships with students, faculty, and staff.

Figure 3.2 Description of the Academic Orientation course from the College Course Catalog.

The table below includes the timeline for this study.

Table 3.3

Timeline of Research Activities

Date	**Activity**
Fall 2012 Semester	Began working on IRB Process and course development for Institution 1
December 20, 2012	Received approval from UK IRB Protocol #12-0942-P4S
Spring 2013	Course was not offered at Institution 1
Spring 2014	New course was created for Institution 2 & IRB Modification approved
Fall 2014	Course not offered at Institution 2
Spring 2015	Course Redevelopment for Institution 3 & IRB Modification approved
Late-Spring 2015	Course offered at Institution 3 (limited participation)
Later Spring 2015	Course Redevelopment for Institution 4 & IRB Modification approved
Week Prior to Summer 2015	Consent Form Distribution to Instructors at Institution 4
Summer 2015	Data Collection at Institution 4
Week Prior to Fall 2015	Consent Form Distribution to Instructors
Fall 2016	Data Collection at Institution 4

Description of the Orientation to Online Learning Course

The intervention in this study was an Introduction to Online Learning course that incorporated the Mastery Model for E-Learning (MMEL) made up from PSI and ML models, and the more recently the Next Generation Learning Challenges Guidelines. In a summary of research on PSI, Taveggia (1976) concluded that unit-mastery, self-pacing, and proctors who provide feedback to students were the three most important elements of PSI. In addition to unit-mastery and feedback, ML included the use of correctives to help a student, who did not successfully complete the formative, learn the information needed to master the content. The additional activities often presented the information in an alternative way to how the information was first presented (Guskey, 1997).

Elements of MMEL:

1. Small units
2. Unit-mastery
3. Self-paced
4. Computer-assisted immediate feedback and timely instructor feedback
5. Correctives

Students in the Introduction to Online Learning course had to demonstrate mastery of one unit prior to going to the next. If mastery was not attained, then students had to review the instructor feedback, course content, view additional content, and attempt the assessment again. This step had to be repeated until mastery was achieved. As a result, there were not specific time parameters for completing the course; rather students had the freedom to complete the course at their own pace, within a 2 or 3-week timeframe. This allowed students who encountered outside commitments that would

have otherwise prevented them from meeting the assignment deadlines of an instructor-paced course to still succeed.

Instruments

Demographic Questionnaire.

To better understand the effectiveness of the Introduction to Online Learning course, it was first important to understand the technology background of the students participating in the study. Demographic information was collected during the first unit of the class. Students were asked to answer a variety of questions regarding their

- technology access
- devices they use
- ways they use technology
- the level of assistance they need with software and applications
- how often they use a computer
- who they ask for help

In addition, students were asked to:

- identify their college status (freshman-graduate student)
- their major
- current college GPA
- plans after graduation
- year they were born
- why they signed up for an online course
- the number of online courses they had previously taken
- if they had ever dropped an online course

- if so**,** why they dropped the online course

GRIT Scale

Also included in the initial questionnaire was an 8-item Likert-style scale developed by Duckworth and Quinn (2009). The 8-item Likert-style scale is a revised version of their original 12-item Likert-style GRIT scale designed to measure an individual's "perseverance and passion for long term goals" (Duckworth et al., 2007, p. 1087). Sample items from the GRIT scale include statements such as "New ideas and projects sometimes distract me from previous ones" and "Setbacks don't discourage me." The complete measure is shown in Appendix A.

The original scale used a Likert-style scale that allowed for five possible responses to each question (1= not at all like me to 5=very much like me) (Duckworth et al., 2007, p. 1090). For this study, the researcher used the 8-item GRIT scale with a four-point scale (1=very much like me, 2= like me, 3=not like me 4= not at all like me). Four of the eight items were reverse scored. A neutral option was not provided so participants had to select a position. By doing so, the researcher lost the comparability to the GRIT scale, but gained the ability to trust this measure and triangulate the findings.

Pre-test/Posttest of Technology Skills and Knowledge.

In order to determine if student learning occurred as a result of the course, a pre-test and posttest of content was administered. Content included questions about their learning management system, citing sources and plagiarism, identifying scholarly sources, common programs needed in their online course, and how to best communicate with their instructor and stay abreast of course announcements and updates. The posttest

covered the same content. Some of the questions were identical to the questions asked in the pretest. In addition, some of the items on the post-course questionnaire asked students whether or not they did specific activities that were recommended by the course instructor (such as download Microsoft Office 365 and the Blackboard Mobile App). Students were also asked about how helpful they found specific sections of the course (the discussion board unit, the practice quizzes, and the unit on Library Resources). Students were asked to rate to what degree they benefited from the course and to what degree they think others would benefit from the course (1= not at all; 2= a little; 3=somewhat; 4=a lot).

At the very end of the post-course questionnaire, I offered three open-ended opportunities for students to provide feedback. Students were asked to identify which elements of the course they found most beneficial and which they found least beneficial. There was also a text box for any additional comments.

SmarterMeasure.

The SmarterMeasure tool is a "learning readiness indicator" designed to help first-time college students and their advisors identify students' strengths and areas for improvement prior to staring college (*SmarterMeasure: Learning readiness indicator*, n.d.). It has seven sections including two that cover technical skills: the Technical Competency and Technical Knowledge sections. When students are finished with the indicator, they receive a pdf printout of their results along with tips and website resources they can use to strengthen their skills.

SmarterMeasure seven components:

- Individual Attributes - motivation, procrastination, willingness to ask for help, etc.

- Life Factors
- Learning Styles
- Technical Competency
- Technical Knowledge
- On-screen Reading Rate and Recall
- Typing Speed and Accuracy

The purpose of using this tool for this study was to identify students' baseline technology scores and then re-test students after they completed the mini-course to assess if there was an increase in their technology scores. Students enrolled in the Introduction to Online Learning course took all seven components of the SmarterMeasure assessment during the first two units of the course as part of the course requirements. In addition, as part of the mini-course, students took the Technical Competency and Technical Knowledge components of the Smarter Measure during the last unit of the course. This data was treated as posttest data to determine if students' technical understanding improved as a result of taking the Introduction to Online Learning mini-course.

The Technical Competency section was designed to assess whether or not students could complete specific tasks in a variety of software applications. Given a picture of the interface of a software program, students had to identify the correct icon to click on to complete a given task. Due to the proprietary nature of this third-party software, I cannot reproduce their questions. Instead, see Figure 3.3 for an example question from a different software application.

This image is taken from a presentation software program. Four sections of the image are labeled:

A-An icon of a new slide

B-An icon of a floppy disk

C-The “Format” menu item

D-The “View” menu item

Which area would you click on to insert a new slide in to the presentation below:

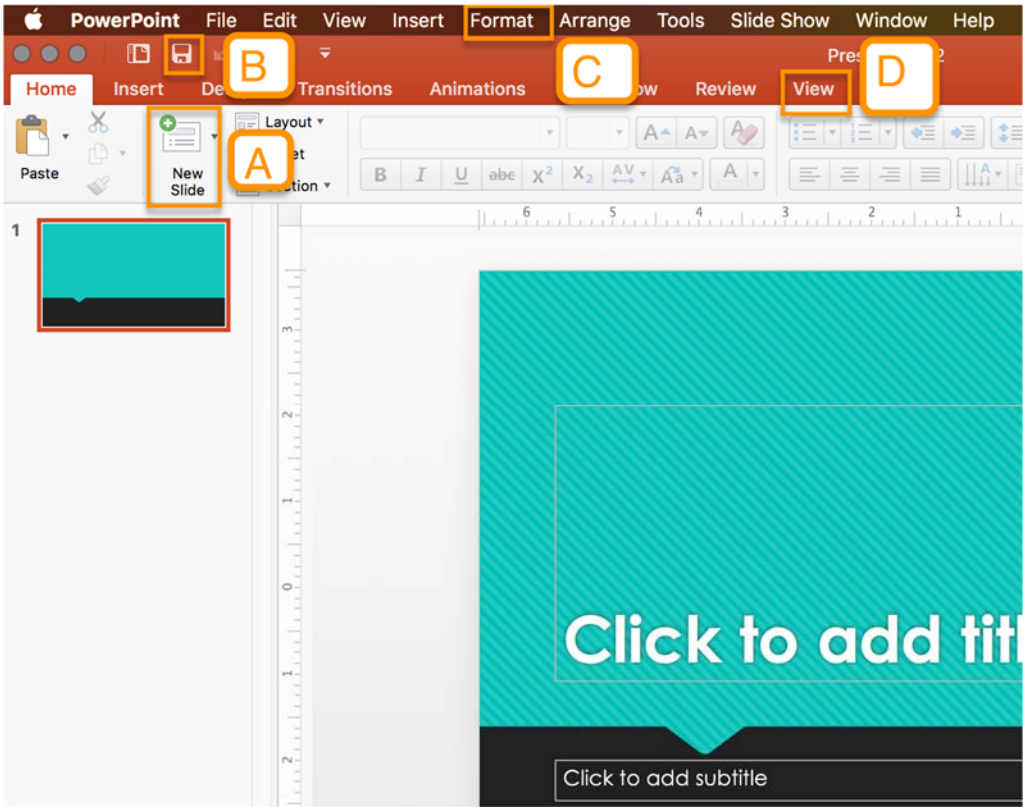


Figure 3.3. Similar Style Question as in Technical Competency Section of SmarterMeasure

The Technical Knowledge section asks students to select the option that best describes their technology abilities for a variety of tasks related to computer usage. This section is scored on a 0-3 scale. When a student indicates they do not use the program or do not do a particular task, then they receive a score of “0”. A score of “3” is given when students indicated they can complete the most advanced features of that task or program.

In addition, some of the items ask student to select the correct definition for a variety of technology terms. These are scored as "0" for the incorrect answer and "1" for the correct answer.

SmarterMeasure reports reliability coefficient calculations conducted in 2011 show a Cronbach Alpha Reliability of .81 for Learning Styles, .80 for Individual Attributes, .76 for Life Factors, .75 for Technical Knowledge, and .38 for Technical Competency. The area of Technical Competency had the lowest item reliability but it also had the fewest number of items (10) and the scale only included two possible answers (0,1) (*SmarterMeasure: Learning readiness indicator*, n.d.). Additional studies of SmarterMeasure, as reported on the SmarterMeasure website (http://smartermeasure.com/), indicate a strong construct validity at the .01 level regarding the degree to which SmarterMeasure is an indicator of whether an online or technology-rich course is a good fit for the student (*SmarterMeasure: Learning readiness indicator*, n.d.). The Internet Competency portion of the Technical Competency measure and the Technical Vocabulary portion of the Technical Knowledge measure were statistically significant predictors of GPA.

Students' request for assistance.

As the research indicates, technology is also a barrier to students successfully completing a course. Therefore, I kept a log of students' requests for assistance both for technology related issues and course-design and content issues. This log provided insight into the types of issues students had and because the information was linked to specific students, I was able to look for characteristics among those who asked for help.

Procedures

Six instructors from the Summer 2015 semester and six instructors from the Fall 2015 semester were asked to participate in the study. All of the instructors agreed to participate in the study. Those who agreed to participate gave their consent to allow me to ask that their students participate in the study. Instructors were not made aware of which students chose to participate in the study. No data regarding the instructors were collected.

Most of the students received an invitation via e-mail to participate in the study. The instructors of students enrolled in the Academic Orientation to College course requested I meet with their students in-person. All students in the courses were enrolled in the Introduction to Online Learning course. Once enrolled, students could decide whether or not to take the course, and if they decided to take the course, whether or not they wanted to participate in the research study. This way, all students had the opportunity to benefit from this course, but only data from those who consented was collected and analyzed.

Research Questions

Central Question:

How do the design and implementation outcomes of an orientation to online learning course address issues related to students' technology preparation, skills and student support services for undergraduate and graduate students with varying degrees of online experience?

Research Question 1: How do students' skills and needs match with the content of the course?

Research Question 2: How adaptable was the existing institutional online education system to integrating an orientation to online learning mini-course?

Research Question 3: How do students with previous experience perceive the orientation to online learning mini-course?

Analysis

One aspect of case studies that makes them unique is the opportunity to analyze the data as you collect it; there is "no particular moment when data analysis begins" (Stake, 1995, p. 71). Also, it is important to validate the findings (p. 87). Using Mayring's (2000) deductive categorical analytic approach, I applied existing concepts from Greenhalgh et al. (2004) Implementation Science to frame an analysis of the quantitative and qualitative data, as shown below in Table 3.4. Specific terms and components of the Greenhalgh et al. model that were elaborated by these authors were used as coding categories for qualitative or quantitative data sets.

Table 3.4

Coding Agenda

Category	Definition based on Greenhalgh et al. (2004, p. 595)
System Readiness	• Tension for change • Dedicated time/resources • Monitoring and feedback
Adopter	• Needs • Motivation • Skills • Values and Goals

Table 3.4 (continued)

Assimilation	• Complex, non-linear processes
	• Soft-periphery elements
Implementation	• Decision making devolved to frontline teams
	• Hands-on approach by leaders and managers
	• Human resource issues
	• Dedicated Resources
	• Internal Communication
	• External Collaboration
	• Reinvention/development
	• Feedback on Progress

Limitations of This Case Study

There are several limitations to this case study. One limitation was the decision to use a four-point Likert-style scale rather than the five-point scale used by Duckworth and Quinn (2009. This decision erodes the reliability of the GRIT scale. In addition, while it was not the original intent, the researcher was the course designer and instructor of the mini-course which may have led to researcher bias. The smaller than desired number of first-time online student participants was also a limitation.

In general, case studies are limited in how much they can be generalized. While this is an instrumental case study, and thereby more like to be able to be generalized, it had limitations. It would be beneficial to take the lessons learned from this study and

conduct a quantitative or mixed-methods study with more participants who are new to online courses.

Chapter 4-Findings

The findings from this study are presented in this chapter and data are organized by research sub-questions.

Research Question 1: How do students' skills and needs match with the content of the course?

Demographic Questionnaire.

This section is an overview of the responses to the online demographic questionnaire, delivered prior to students' participation in the Introduction to Online Learning orientation mini-course (see Appendix D). As previously noted in Chapter 3, the majority of students in this study had taken at least one online course prior to this semester (73.85%, n=48). Only 26.15% of the participants (n=17) had not taken an online course prior to this semester (see Figure 4.1).

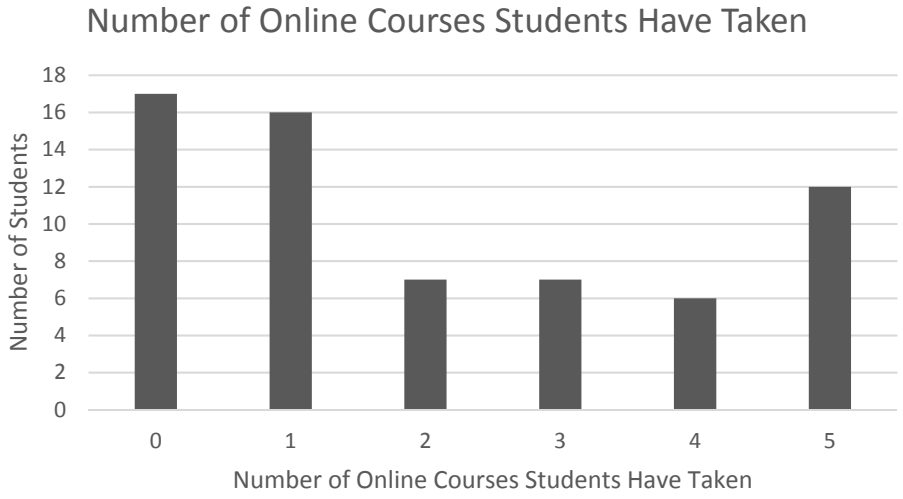


Figure 4.1. The number of online courses students took prior to taking this mini-course.

Of the 65 study participants, six had previously dropped an online course. In response to the question "Have you dropped an online course for any reason?" on the demographic questionnaire, students who selected "yes" were asked to "Please indicate why you dropped the online course." Their responses are listed below:

- It was when they first came out and I was not prepared for the rigor of an online teach yourself course.
- Course was more advance than expected or prepared for
- Winter intersession is expensive and the drop window is bogus! Still not happy with XX for that.
- Time commitment (work/family schedules)
- Took too much time
- The course was too advanced.

Half of the responses (n=3) pointed to the rigor of the courses and two responses addressed the time commitment it takes to successfully complete an online course. This is consistent with Aragon & Johnson's (2008) findings which identified "personal reasons and time" and "course design and communication" as the most frequent reasons students drop online courses (p. 151). Why students drop their online courses can point to design and institutional issues that may need to change.

Of importance to know is also why students chose to take an online course. Students were asked *What best reflects the reason you signed up for an online class?* Students could select from the following list:

- There wasn't an in-class version of this course.

- I couldn't attend class during the in-class times because of work or family commitments
- I prefer to take my classes online.
- I am traveling this summer and can't take classes on campus.
- I am going home for the summer and can't take classes on campus.
- Other (please indicate the reason)

Over half (52.3%, n=34)) of the students indicated they took an online class because there was "no in-class version." Nearly a quarter of the students (24.6 %, n=16) indicated "other", 20% (n=13) indicated "Work and Family Commitments, 15.4% (n=10) indicated they were traveling or going home for the semester. Only7.7% (n=5) of the students indicated that they prefer to take online classes (see Figure 4.2). If the majority of students are taking online courses because they feel they have no other options and this delivery format is not their preference, it may affect their motivation to do well in the online course environment.

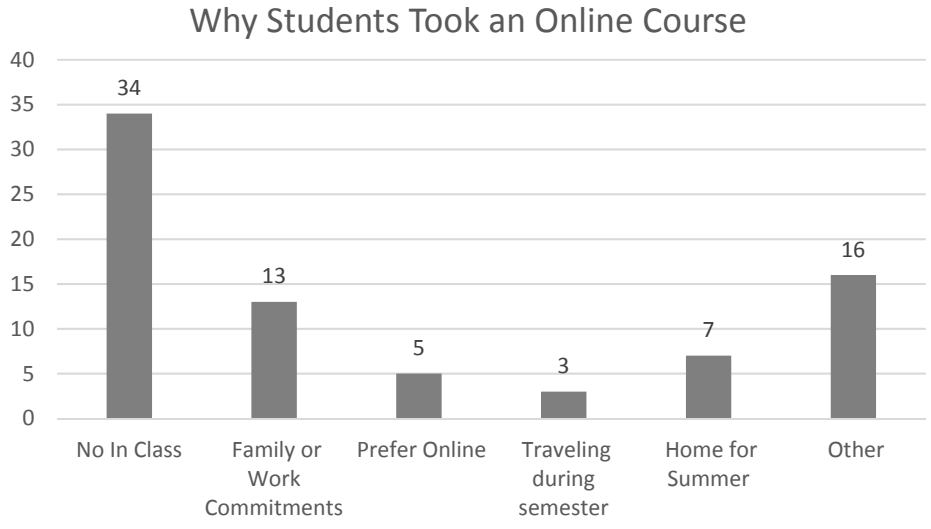


Figure 4.2. Why students took an online course.

Students were asked *What is your overall GPA since enrolling at this institution?* The majority of students (72.3%, n=47) have a 3.0 or higher GPA (see Table 4.1).

Table 4.1

GPA of Study Participants

GPA Response Choices	n=65
No GPA/First Semester	11
Less than 1.0	0
1.0-1.4	0
1.5-1.9	0
2.0-2.4	1
2.5-2.9	6
3.0-3.4	10
3.5-3.9	21
4.0	16

In order to better understand the behaviors and traits of students who enroll in online courses, I adapted a questionnaire from Rebecca Combs (2011). Items in this questionnaire ask students about their access to technology and their technology-related behaviors.

Question 1 asked students to *Please select all of the technology devices you frequently use.* The two most frequently used devices were "Smart Phones" and "Laptops." Sixty-three (n=63) students indicated they use a smart phone and 62 students

indicated they use a laptop. The next most frequently used device was a tablet (n=27), followed by personal computer (n=18) and MP3 Player/iPod (n=10) (see Figure 4.3).

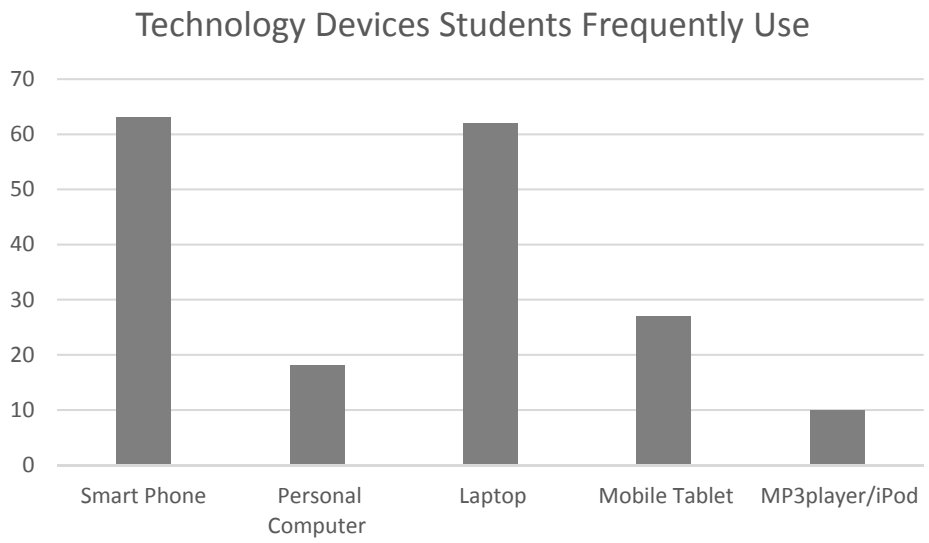


Figure 4.3. The Technology Devices Students Frequently Use

Students were asked *What kind of internet connection do you have?(Select all that apply).* The majority of students (86.15%, n=56)) had access to Wi-Fi, 30.8% (n=20) of students had access to cable internet, 7.7% (n=5) had access to DSL, and 1.5% (n=1) had access to satellite internet access (see Figure 4.4).

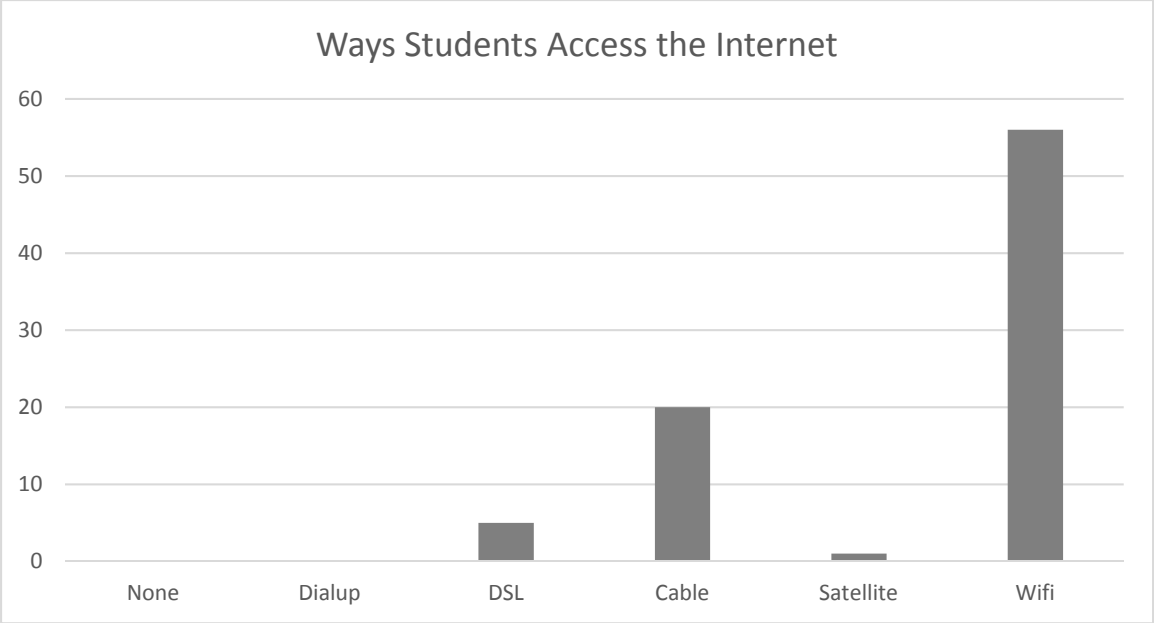


Figure 4.4. Types of Internet Connections Students Reported

The number of students with internet access is slightly higher than the statistics reported for the public school students in the state where this study took place. The report states that 88% of public school (K-12) students have internet access at home and that 94% of those students who reported having access, also had wireless access at home (Name of State Redacted/Department of Education, 2016). This survey did not ask where students accessed the internet. Only 40% of students had access to a form of internet that they could access via hard-wire. For those who rely on Wi-Fi, it would be interesting to know where they access the Wi-Fi: home, dorm room, café or another public form of Wi-Fi. This information is relevant because not all Wi-Fi access is reliable or stable and it can become a problem when students are taking online tests in their courses. This can interfere with the students' overall online course experience.

The next question asked students to select all the ways they use technology. Students indicated they use technology most frequently to check email (98.5%, n=64) followed by Word Processing/Typing (93.8%, n=61) and accessing Blackboard (93.6%,

n=61). Students use technology less frequently to Write blogs (18.5%, n=12), access LinkedIn (29.2%, n=19) and participate in Gaming (38.5%, n=25) (see Figure 4.5).

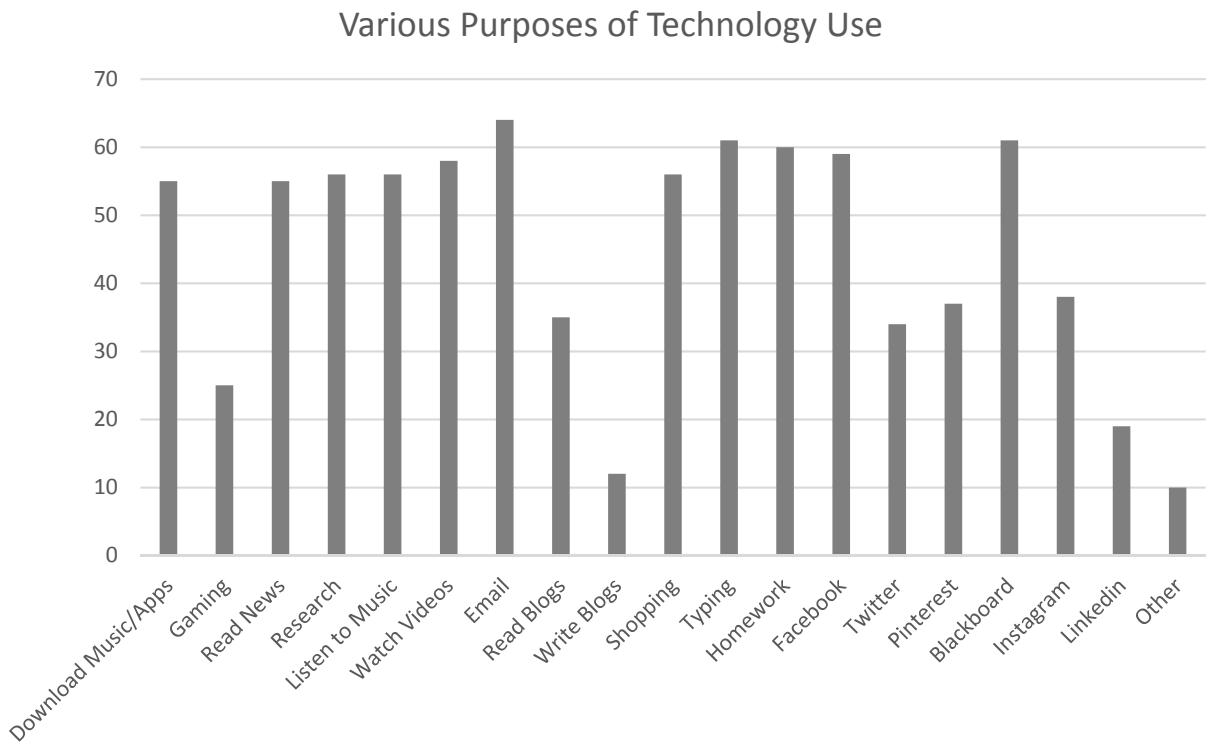


Figure 4.5. Various Purposes of Technology Use

Students also had the option to indicate other ways they used technology. These responses are listed in Table 4.2.

Table 4.2

"Other Ways" Students Use Technology (Indicated in an Open-Ended Text Box)

Other Ways Students Use Technology	Number of Students
Work Database	1
Canvas	5
Tumblr	2
Reddit	1
Make Video Explanations for Student's Homework	1

The most frequent "Other" response was "Canvas." At the time this questionnaire was created for the Summer 2015 semester at Institution 4, Blackboard was the institution's LMS. Many references were made to Blackboard in the pre-course and post-course questionnaires. During the Fall 2015 semester, the institution was beginning to transition to Canvas and some of the instructors chose to use Canvas instead of Blackboard. While I revised the mini-course to make a Canvas version, I didn't update the questionnaire. This led discrepancies in the data and is the reason multiple students identified "Canvas" as "other ways they use technology."

In addition to asking students what technologies they use, I wanted to have a sense of what technologies they use for their classes and how technology-rich their classes are. Students were asked *Please select all of the technologies you use for your classes.* Students reported using Email (100%, n=65), Word Processing (98.5%, n=64), and Blackboard (98.5%, n=64) the most frequently. Students also reported using Online

Library Resources (73.8%, n=48) and Videos (66.2%, n=43) in their classes (see Figure 4.6).

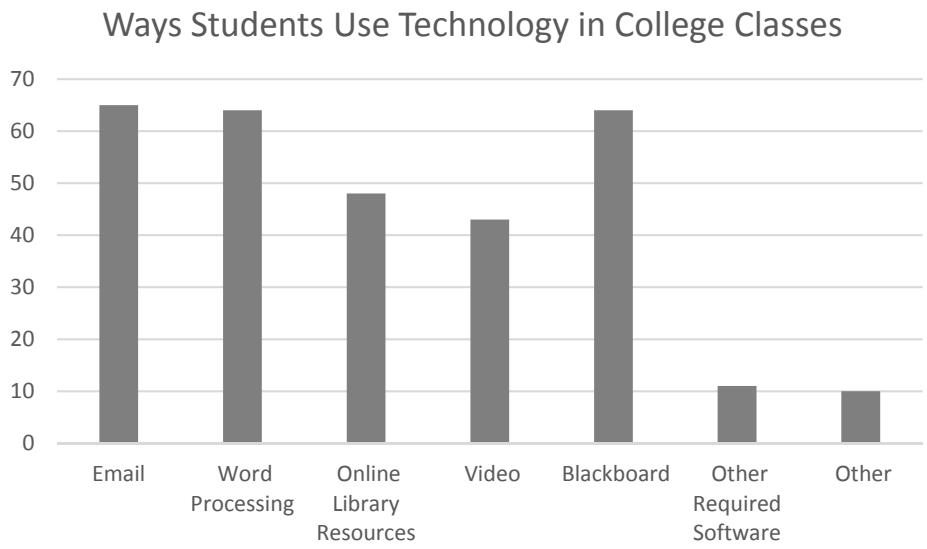


Figure 4.6. Ways Students Use Technology in Their Classes.

Students indicated that they use the following "other required software" for their classes (see Table 4.3).

Table 4.3

"Other" Required Software Students Use for Their Classes

Other Required Software	Number of Students
StatCrunch	1
ArcGIS	1
SPSS	3
ExamSoft	1
OTIS	1
SimUText	3
SimUbio	1

Additionally, students identified "other" perhaps not required, software they use for their classes. Again, Canvas was identified as "Other" software students use (see Table 4.4).

Table 4.4

Other Software Students Use for Their Classes

Other Software Students Use	Number of Students
Canvas	9
Text to Speech	1

Since the research indicates technology can be a barrier to the successful completion of an online class, and the research is not clear on how to determine if a student is prepared for the technology skills and behaviors needed to be successful in an

online class, I asked students to identify how frequently they used specific software applications using a Likert-style scale. As mentioned earlier, this study was originally intended for community college students so when designing the survey, I anticipated participation from students who were enrolled in a variety of associate degree and trade certificate programs and included software that would be essential to these programs. In addition, I included social media applications such as Facebook and online support tools, such as Khan Academy and iTunesU. In all, there were 25 software applications (see Appendix D, Question 4 and 5 for a complete list of the software applications). Students had to *Select the option that best describes how often you use the following* [each program] using the following Likert-style scale:

1=Never

2=Once or twice a year

3=Monthly

4=Weekly

5=Daily

6=Several Times a Day

The twenty-five software applications fit into one of two categories: digital tools used by a consumer or those used by a producer. Digital Producer technologies would be those that fall within "Productivity Software," "Digital Creation," and "Development Software" as shown in Figures 4.7, 4.8 and 4.9. These include Movie Maker/iMovie, Webpage design/creation (Wordpress, HTML, XML, etc.), computer programming and Adobe Acrobat, as well as software used for word processing, spreadsheets, presentation, and databases.

Figure 4.7 shows the frequency of students' use of Word Processing, Spreadsheet, Presentation and Database tools. Over half of the students (54.7%, n=35) use Word Processing software daily, or multiple times per day. Students used spreadsheets on a less frequent basis. They mostly used spreadsheets monthly (33.8%, n=22) or once or twice a year (24.6%). The majority of students used presentation software monthly (56.9%, n=37). Databases were used the least frequently with 63.1% (n=41)of the students indicating they never use database software.

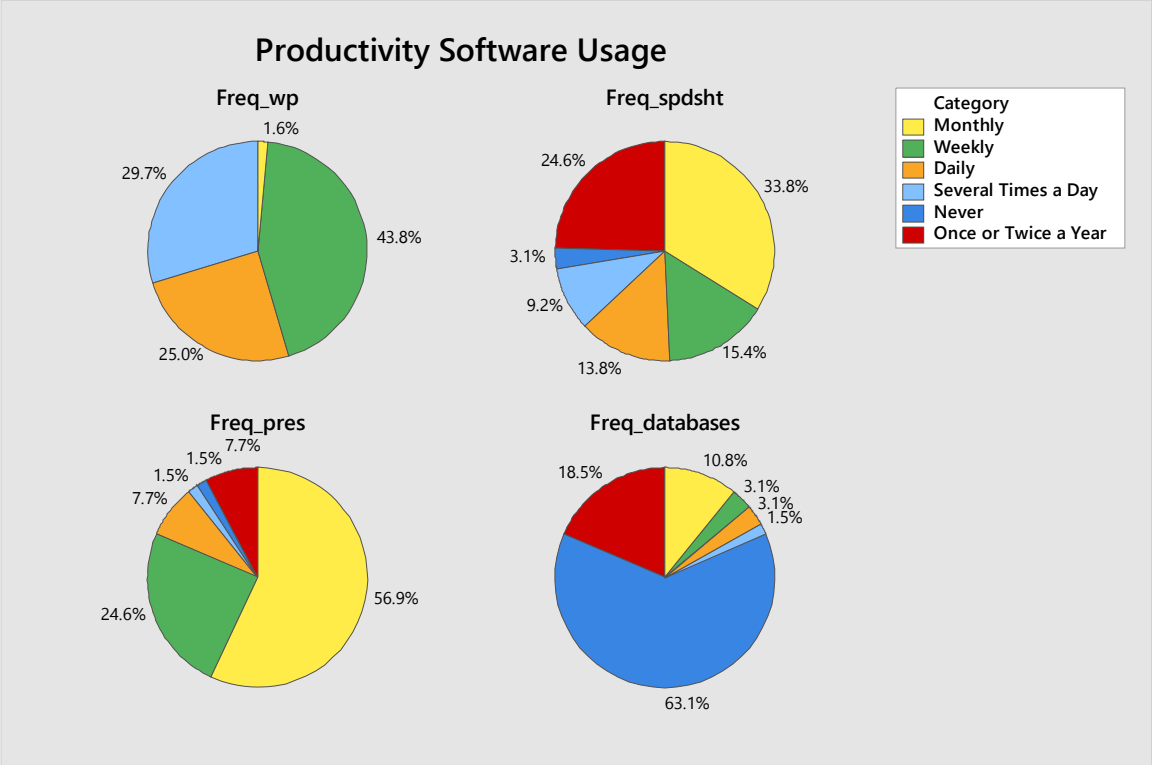


Figure 4.7. Frequency that students use these productivity software applications. WP=word processing, spdsht-spreadsheet, pres=presentation, databases=databases.

Figure 4.8 summarizes the frequency of use for three tools that are considered "digital creation" tools. The majority of students indicated they "Never" use these tools. For Movie software, 50.8% (n=33) of the students indicated they never use; for webpage

software, 66.2% (n=43) of the students never use and for Adobe Acrobat, 50.8% o (n=33) f students indicate they never use the software.

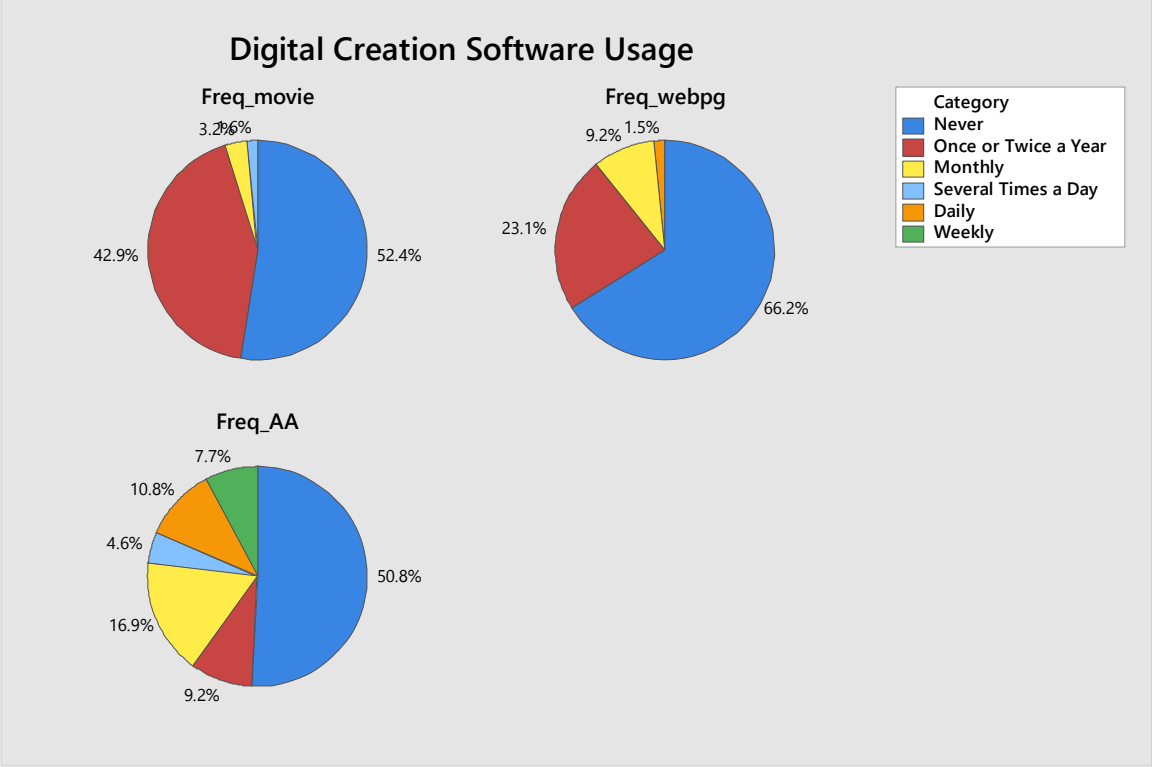


Figure 4.8. Frequency that students use these digital creation software applications: MovieMaker/iMovie, webpage development software, and Adobe Acrobat.

The results in Figure 4.9 are even more dramatic. The vast majority of students have never used these tools: Adobe Creative Suite (73.8%, n=48), computer programming software (80.0%, n=52), multimedia development software (69.2%, n=45), and AutoCAD (95.4%, n=62).

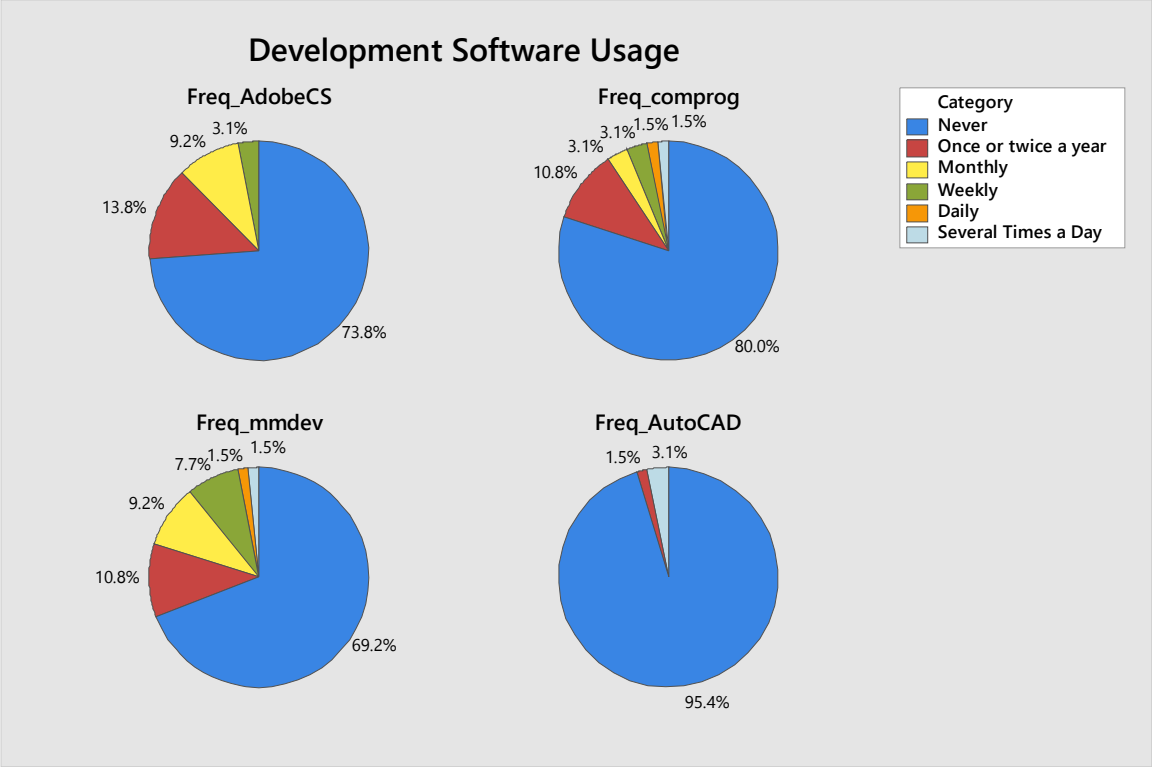


Figure 4.9. Frequency that students uses these development software applications; Adobe Creative Suite, computer programming, multimedia development, AutoCAD.

Other technologies are used mostly for consumption, or by a consumer, such as the social media technologies and the school-related technologies listed (see Figures 4.10 and 4.11.

In Figure 4.10, it is apparent that social media usage varies greatly by the specific social media application. For example, 76.9% (n=50) of students use Facebook "daily", or "several times a day" whereas, in each of the other three social media apps, the largest category is the "Never" category: LinkedIn (60%, n=39), Twitter (44.6%, n=29), and Instagram (36.9%, n=24). Interestingly, the second and third largest categories were "daily" or "several times a day" for Twitter (33.9%, n=22) and Instagram (49.3%, n=32).

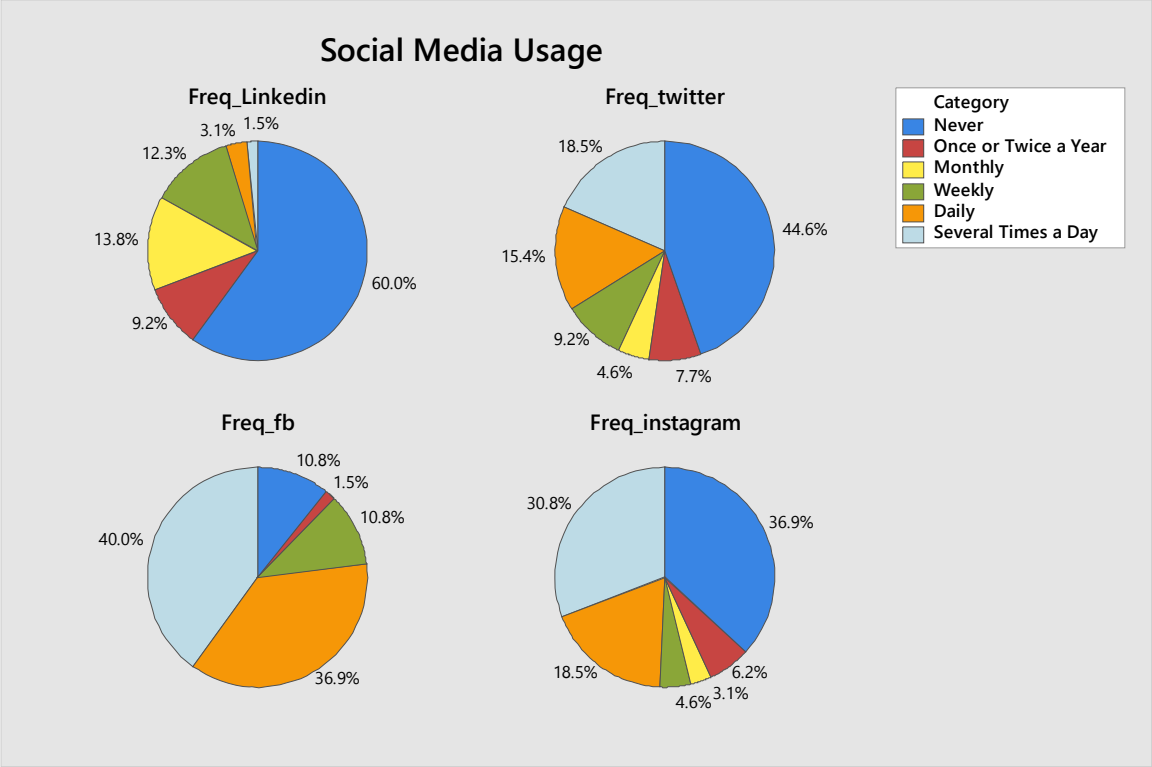


Figure 4.10. Frequency students use these social media applications: LinkedIn, Twitter, Facebook, Instagram

The next grouping of software applications and technologies are those students use for class: discussion board, email, internet, Adobe Reader and LMS (see Figure 4.11). With the exception of the discussion board, students reported using these tools with great frequency. All of the students indicated they used the internet "daily" or "multiple times per day" and 96.9% (n=63) of students indicated they checked with email "daily" or "multiple times per day." Only 63.1% (n=41) of the students indicated they used their LMS "daily" or "multiple times per day." Students most frequently used the discussion board "weekly" (38.5%, n=25) followed by "monthly" (20.0%, n=13). For Adobe Reader, the largest category was those who use this tool "weekly" (29.2%, n=19). Nearly a quarter (24.6%, n=16) of the students indicated they had never used Adobe Reader. This is surprising as until very recently, Adobe Reader has been the primary way to view

pdfs. It may be that the students did not know what platform they were using to view the pdfs.

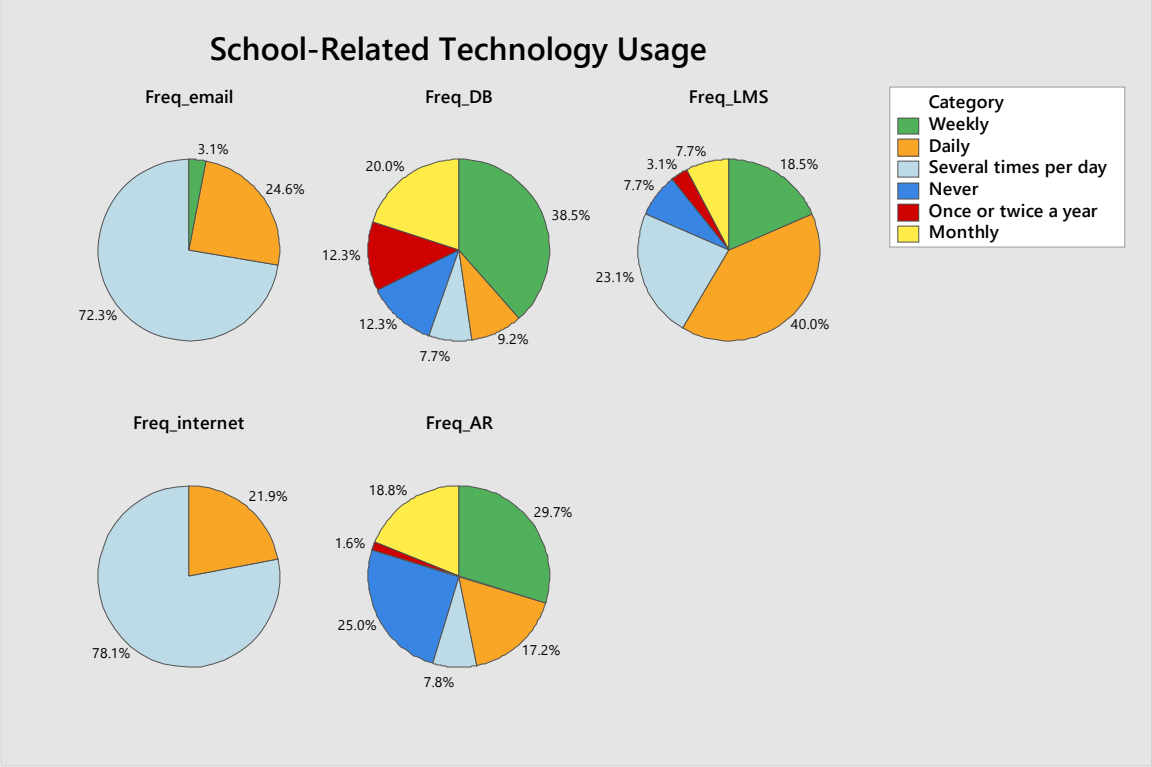


Figure 4.11. Frequency students use these school-related software/technology tools: Email, discussion board, LMS, internet.

Figure 4.12 depicts the frequency of usage for a variety of other tools. Interestingly, supplemental learning tools such as Khan Academy, iTunesU, and blogs are rarely used by this student population. The percentage of students who had never used Khan Academy was 69.2% (n=45) and iTunesU was 71.8% (n=46). A majority of students had either "Never" used blogs (46.2%, n=30) or only used them "once or twice a year" (16.9%, n=11). The largest categories of frequency for iTunes were "monthly" (29.2%, n=19) and "weekly" (27.7%, n=18). Gaming was not as popular as 36.9% (n=24) of the students indicated they never participated in gaming.

In addition, in Figure 4.12 are the technologies students may encounter in their personal technology usage or school-related technology usage. These include Games, Khan Academy, iTunes, iTunesU, and Blogs. These are also mostly used for consuming content unless the student is a developer. In the questionnaire, I did not differentiate between reading or writing a "blog" on this item but considering that most people "read" blogs I counted this as a consumer technology.

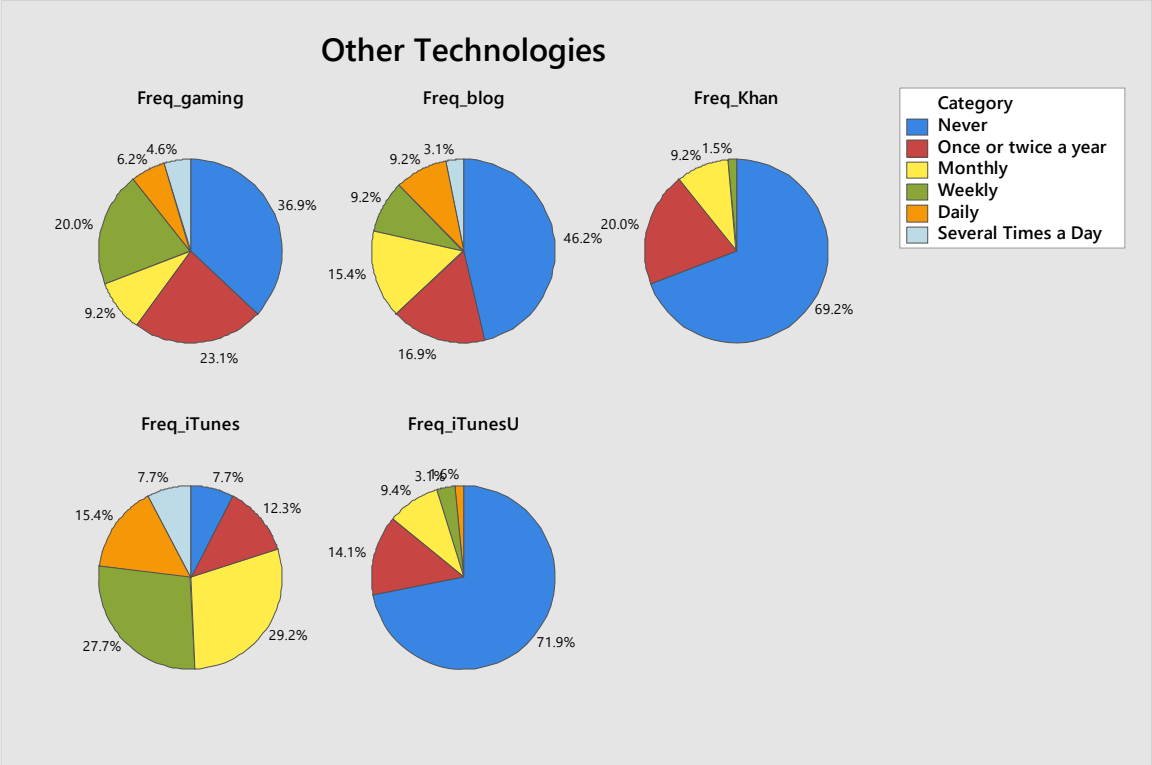


Figure 4.12. Frequency with which students use other technologies: Gaming software, Khan Academy, iTunes, and iTunesU, and blogs.

Software Applications to Which Students Responded they "Never" Use

Table 4.5 lists each of the software applications that a majority of students indicated "never" using, identifies whether or not those technologies are for Producing or Consuming and lists the number of students who "never" use each. All of the

productivity technologies are also ones the majority of students have never used. The majority of students in this study use technologies to consume content rather than to create it.

Table 4.5

Technologies that the majority of students indicated they never use.

Applications Students indicate as "Never" using	Productivity(P)/ Consumption (C)	Number of students (n=65)
Databases	P	41
Computer Programming,	P	52
Adobe CS	P	48
Multimedia Development	P	45
AutoCAD	P	62
LinkedIn	C	39
Webpage Design	P	43
Adobe Acrobat	P	33
Movie Maker/iMovie	P	33
Khan Academy	C	45
iTunesU	C	46

Students' Perceptions of their Technology Proficiencies

In addition to knowing what types of software applications that students use, it is important to understand students' technical proficiencies as operationalized as how much help they need when using these software applications. Students were asked to respond to this question about each of the 25 software applications: *When using each of the*

following software programs and applications, check the statement that most accurately describes HOW MUCH HELP YOU NEED with each. Please mark N/A for programs that you have not used. The following scale was used:

0-N/A I have not used this program before

1-I often need help

2-I sometimes need help

3-I rarely need help

4-I can help other people

In order to understand the students' perceptions of their technology proficiency as a function of their need for help, students' scores across the applications were totaled. The list included such a large variety of programs that it was unlikely one student could indicate for each that they had the ability to help other people. Therefore, if a student selected "0-N/A I have not used this program before" this item was not counted against them. Although there was a total of 100 possible points, each student's points possible varied by the number of programs they indicated using. Once the data was analyzed accordingly, the mean score was 80.32 with a standard deviation of 11.56 (see Figure 4.13).

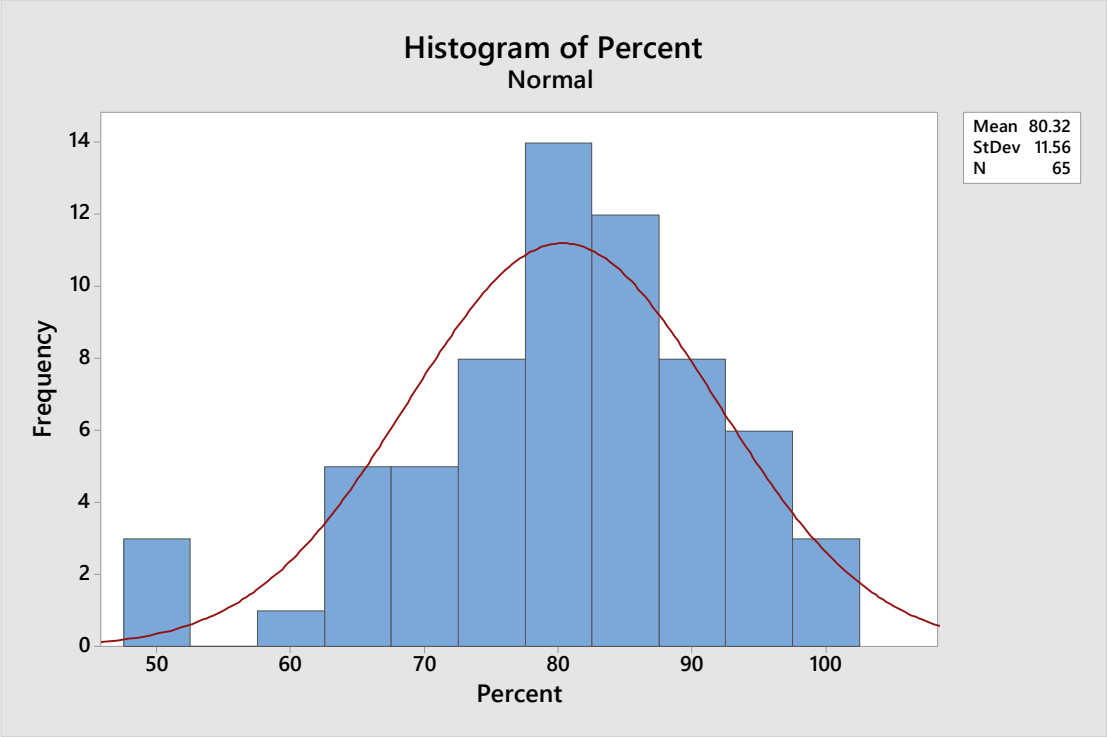


Figure 4.13. Student technology proficiency based on programs they indicated using

Figure 4.14 captures students' proficiencies by how much help they indicate needing. The majority of students said they can help other people with Word Processing (66.2%, n=43) and Presentation (53.8%, n=35) software. Forty percent of students (n=26) indicated they could help others with spreadsheet software and even fewer could offer help with database software (9.2%, n=6).

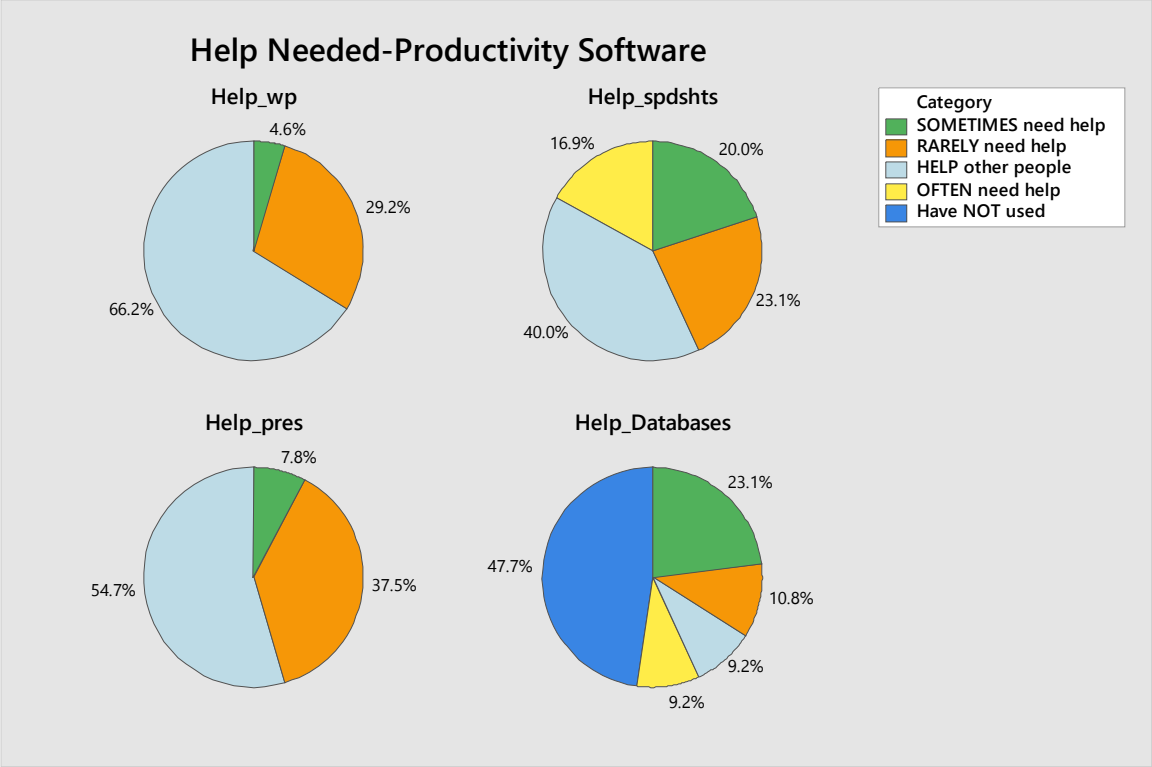


Figure 4.14. Help students reported needing with productivity software: word processing, spreadsheets, presentation, and databases.

Only a very small percentage of students indicated they could help other people with Adobe CS (1.5%, n=1), computer programming (1.5%, n=1) and multimedia development (1.5%, n=1). No students indicated they could help other people with AutoCAD (see Figure 4.15).

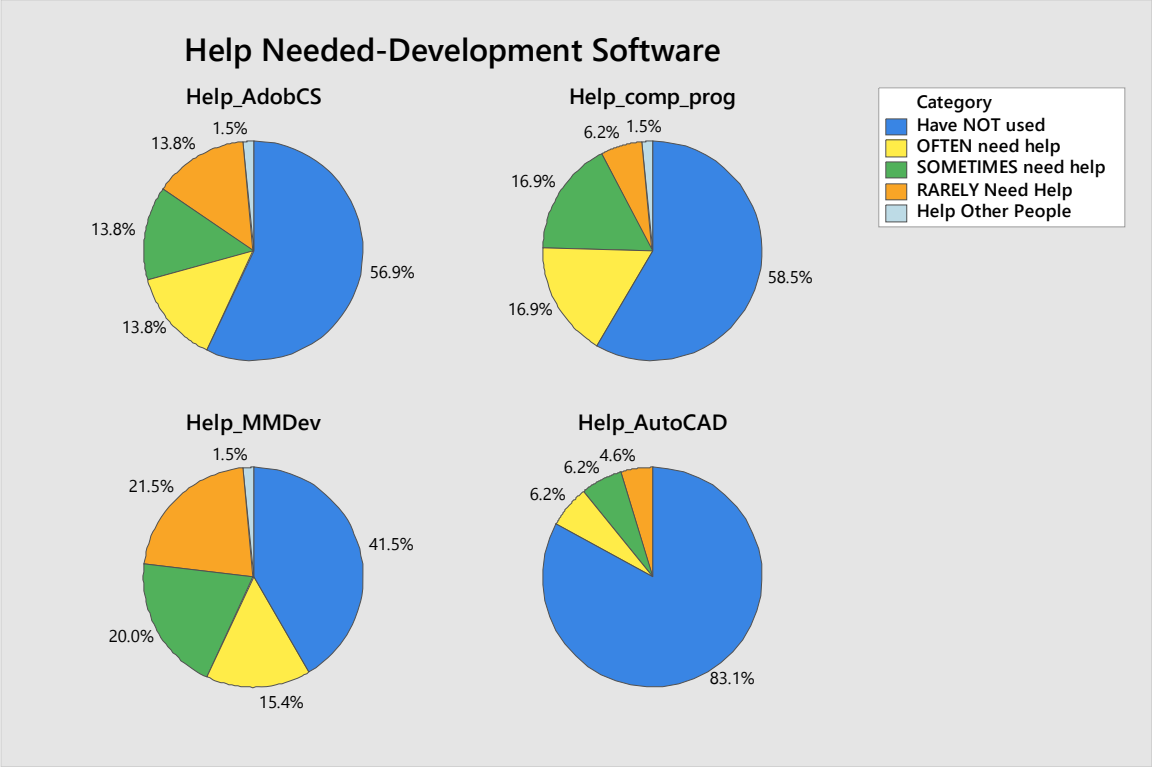


Figure 4.15. Help students reported needing with development software: Adobe Creative Suite, computer programming, multimedia development software, AutoCAD.

The survey indicated students feel more comfortable with social media applications. LinkedIn had the smallest number of students who felt they could help other people (18.5%, n=12) but the other platforms had much higher percentages. Almost half of the students (46.2%, n=30) said they could help others with Twitter, 73.8% (n=48) of students indicated they could help others with Facebook, and 50.8% (n=33) could help with Instagram (see Figure 4.16).

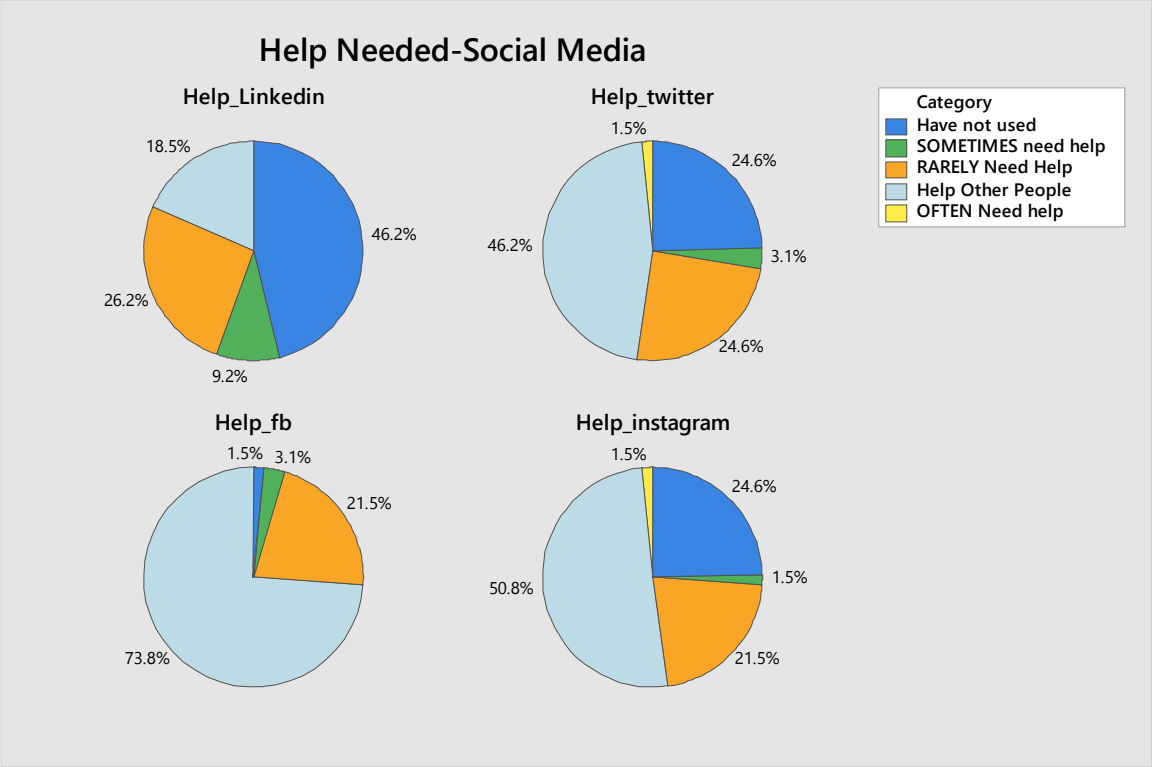


Figure 4.16. Help student reported needing with social media applications: LinkedIn, Twitter, Facebook, Instagram.

Students were less proficient with movie software, webpage design software, and Adobe Acrobat than the social media applications. For movie software, while 32.2% of students had never used it, 33.9% indicated they could "help other people" or "rarely need help." There was a similar finding for webpage design software: 41.5% of students had never used it, however, 29.2% of students indicated they could "help other people" or "rarely need help." Students were more proficient with Adobe Acrobat than the other tools in this category. While 35.4% of students indicated they had not used this tool, 46.1% of students indicated they could "help other people" or "rarely needed help" (see Figure 4.17).

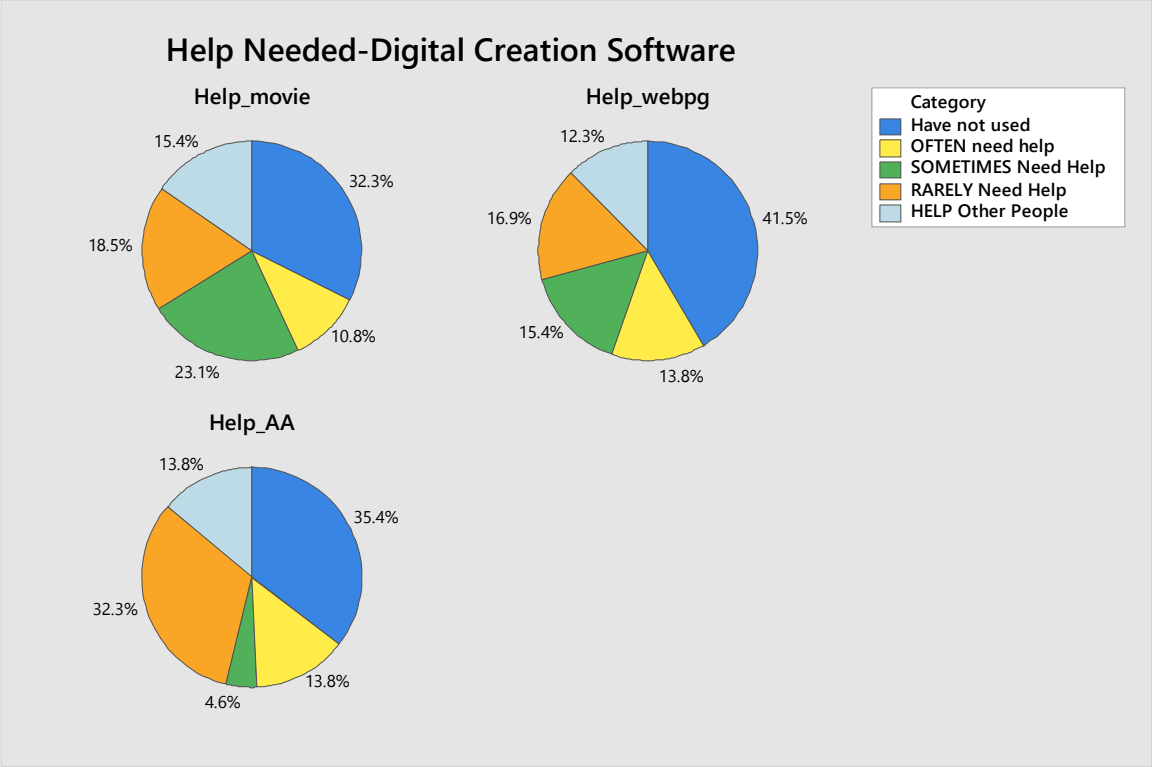


Figure 4.17. Help students reported needing with digital creation software applications: iMovie/MovieMaker, Webpage design, Adobe Acrobat

When it comes to school related technologies, students are confident in their ability to help other people. For email, all of the students indicated they could "help other people" or "rarely need help." For the Internet, 78.5% of students indicated they could "help other people." About half of the students were confident enough to indicate they could "help other people" with discussion boards (53.8%) and Blackboard (50.8%). Adobe Reader had the lowest proficiencies. Only 23.1% of students indicated they could help other people, but this is not surprising given the frequency of use on the previous question. For more information, see Figure 4.18.

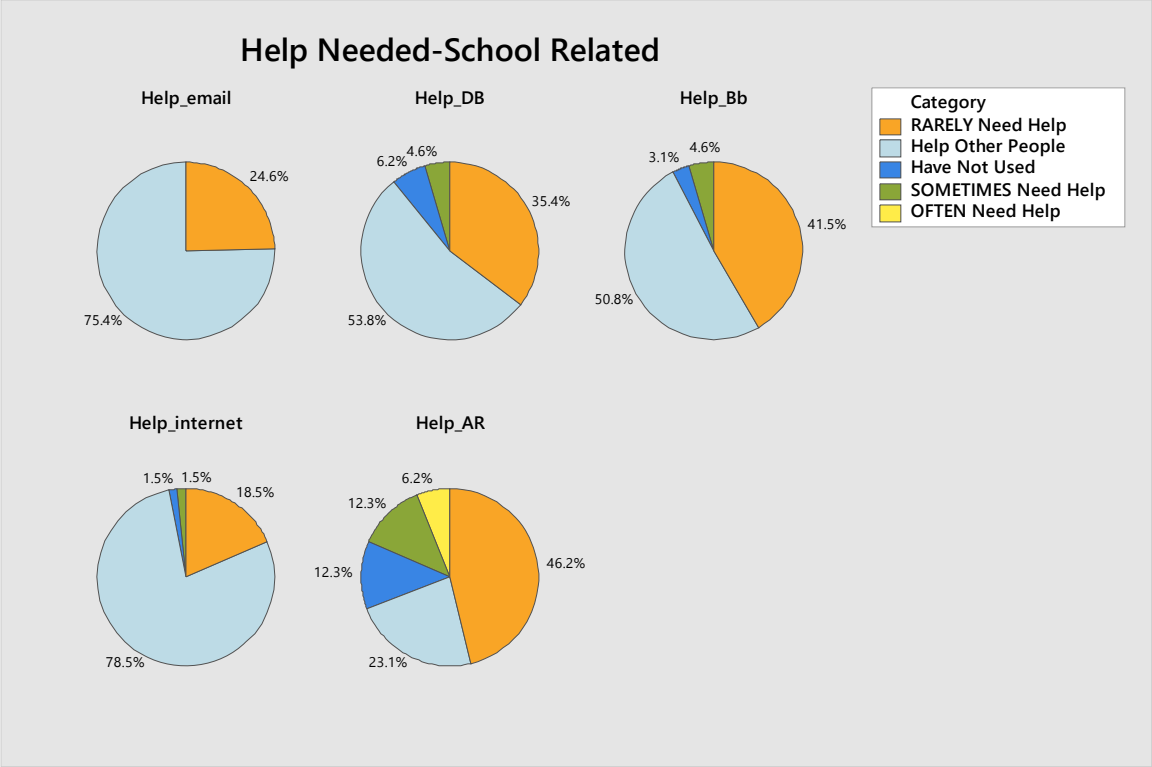


Figure 4.18. Help students reported needing with School-Related applications: Email, Discussion Board, Blackboard, Internet, Adobe Reader

As we discovered in the previous question, the majority of students have not used Khan Academy(52.3%) or iTunesU (55.4%) (see Figure 4.19). Students are more proficient with iTunes as 47.7% of students said they can "help other people." Students are also more proficient with games (41.5% of students say they "rarely need help") and blogs (55.4% of students say they can "help other people" or "rarely need help").

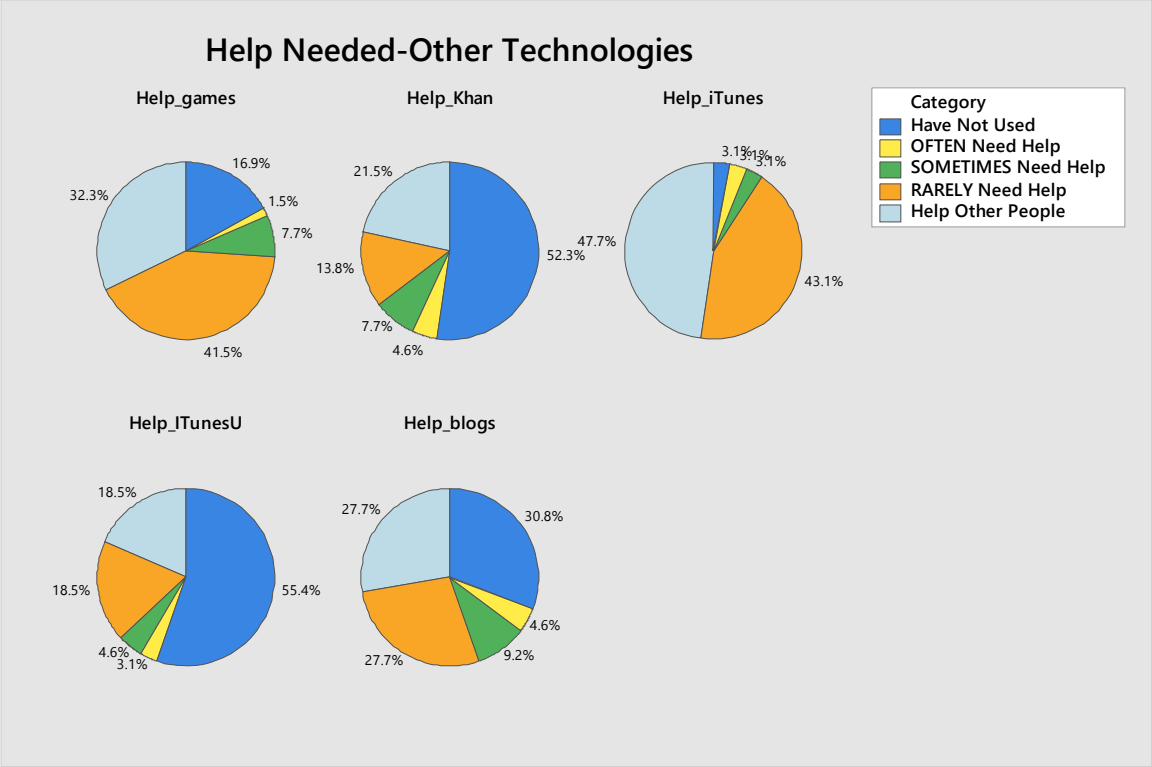


Figure 4.19. Help students reported needing with other technologies: games, Khan Academy, iTunes, iTunesU and blogs.

Overall, students most often needed help with tools and activities such as such as Adobe Creative Suite, computer programming, multimedia development, and AutoCAD. Students were most proficient in and able to help other people with using the Internet and email.

From Whom Do Students Seek Help.

In addition to whether or not students need help, it is important to know who they feel comfortable asking for help. Students were asked: *When I have a question about my online coursework, I feel comfortable asking/consulting my (select all that apply).* When students have a question, they turn to their instructor first. They are also more comfortable asking a classmate or a friend before searching the Internet, asking an

advisor, IT services, or family members. One students indicated "Other" and noted that they search Reddit (see Figure 4.20).

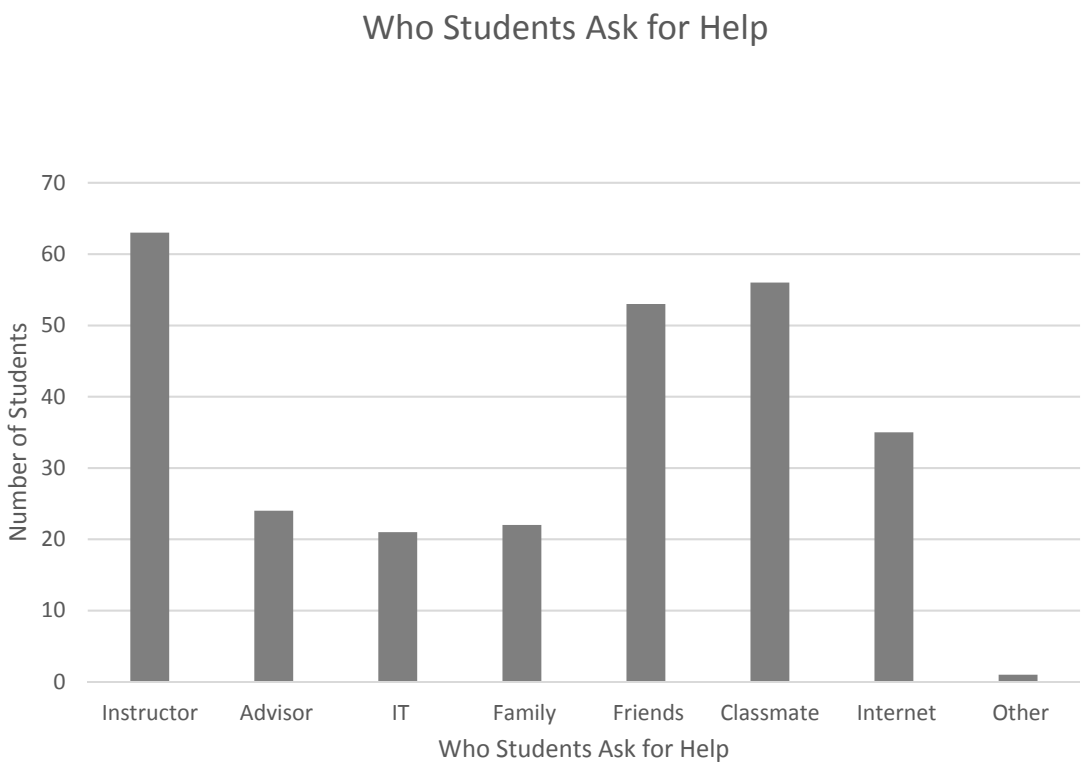


Figure 4.20. Who students ask for help.

Perseverance and Success: The GRIT Scale

Duckworth and Quinn (2009) developed the GRIT scale. This 8-item measure used a 5 point Likert-style scale to determine students' GRIT (see Appendix A for a full list of the eight GRIT scale items).

Very much like me

Mostly like me

Somewhat like me

Not much like me

Not like me at all

Because the difference between “very much like me” and “mostly like me” is difficult to measure, I chose to change the scale from a 5-point scale to a 4-point scale. Leung (2011) found “no differences among 4-, 5-, 6- and 11-point Likert scales in terms of mean, SD, item–item correlation, item total correlation, reliability, exploratory factor analysis, or factor loading” (p.419). Students could choose from the following options:

Very much like me

Like me

Not like me

Not at all like me

Four of the items were reverse scored. The maximum score a student could have achieved was a 32. The highest student score was a 30. The lowest student score was 15. The median score was 24 and the mode was 23 (see Figure 4.21).

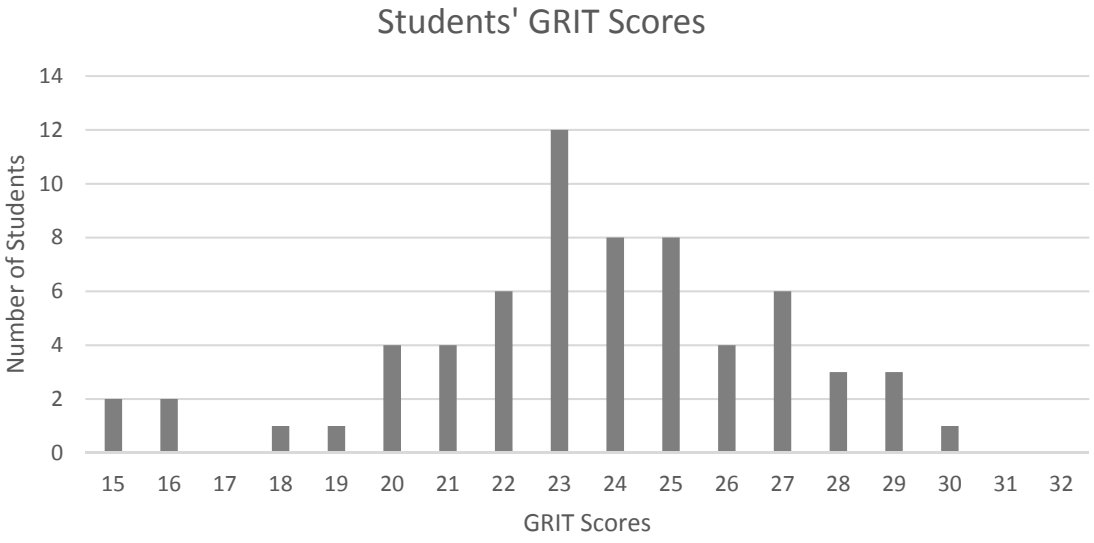


Figure 4.21. Bar Graph of Students’ GRIT Scores.

Because the GRIT scale measures "perseverance and passion for long term goals" I thought the GRIT scale had the potential of being a valuable tool for helping identify students who were more likely to succeed in online courses ((Duckworth et al., 2007, p. 1087). While the GRIT scores varied considerably it was not correlated with their letter grade in the students' for-credit online course (see Figure 4.22). In fact, those earning a "B" grade had a slightly higher GRIT score than those earning an "A" grade.

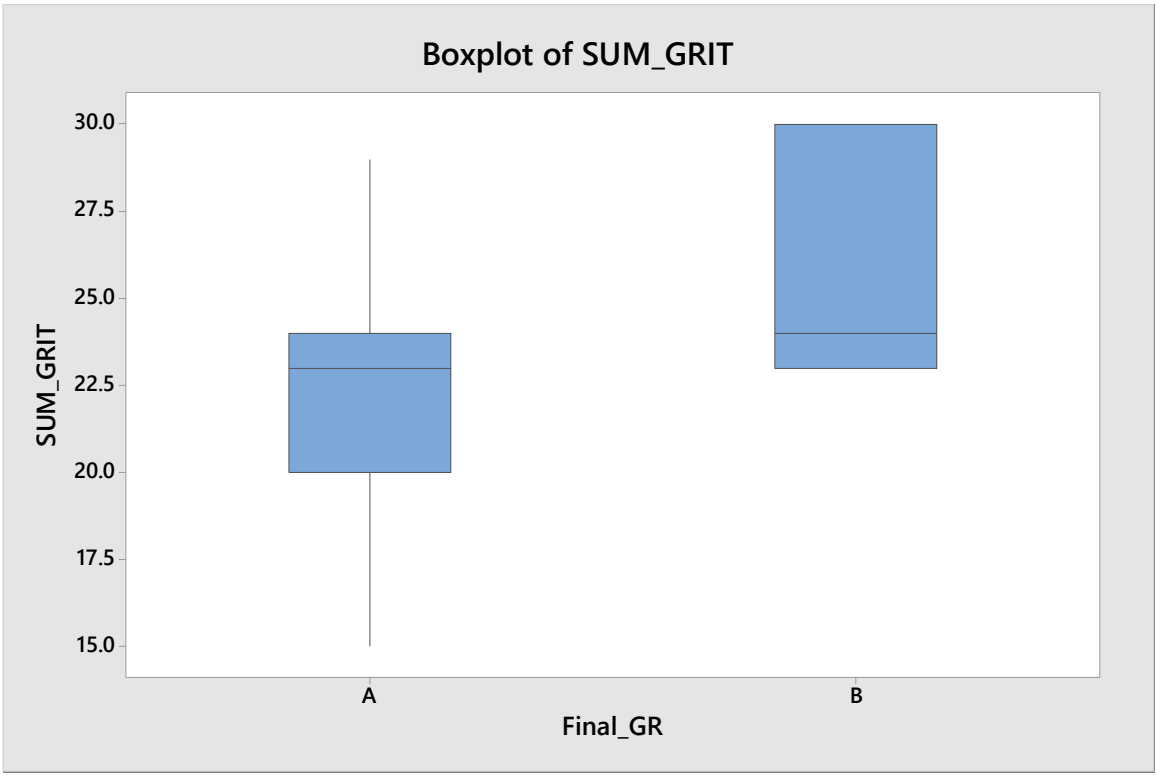


Figure 4.22. GRIT score as compared to final grade in students' for-credit online course.

I looked at GRIT scores across the different college statuses (freshmen, sophomore, junior, senior, graduate student) in order to determine if the GRIT score increased over time as 1) students who were less resilient dropped out of college or 2) students' resilience grew over time as they were in college and exposed to more difficult course material and life decisions (see Figure 4.23). While I thought the freshmen students might have the lowest GRIT score, it was actually the Juniors (n=5) who had the

lowest mean GRIT score. More research is needed to determine if GRIT is correlated with student status. It is possible that by the time students are juniors in college, they are taking more demanding upper-level courses which affects their ability to persevere.

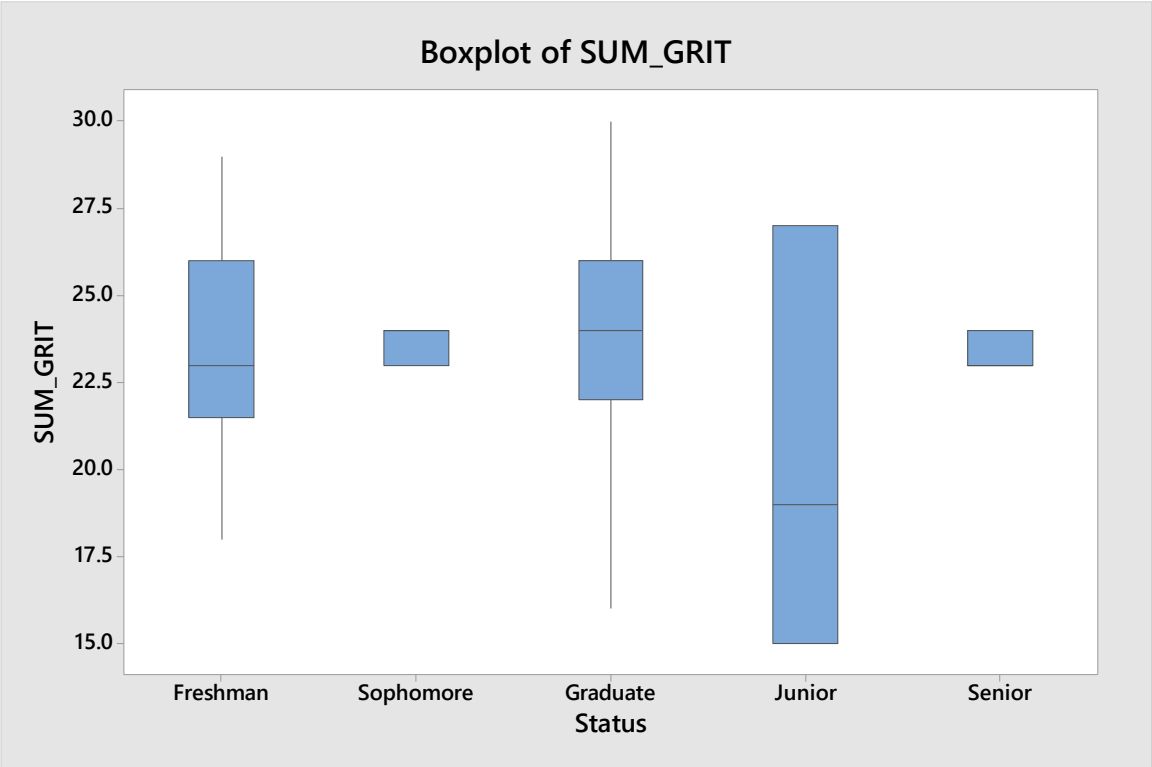


Figure 4.23. Boxplot comparing students' GRIT score and their College Status.

The next few graphs show how students scored on the GRIT by individual items. Four of the items needed to be reverse scored: "Setbacks don't discourage me", "I am a hard worker", "I finish whatever I begin", and "I am diligent". The figures below reflect this scoring. In all instances, the more desirable behavior is reflected by a higher score.

This item: *New ideas and projects sometimes distract me from previous ones* was the only item that the majority of students respond with a "2". In fact, the median and the mode were both equal to 2 (see Figure 4.24).

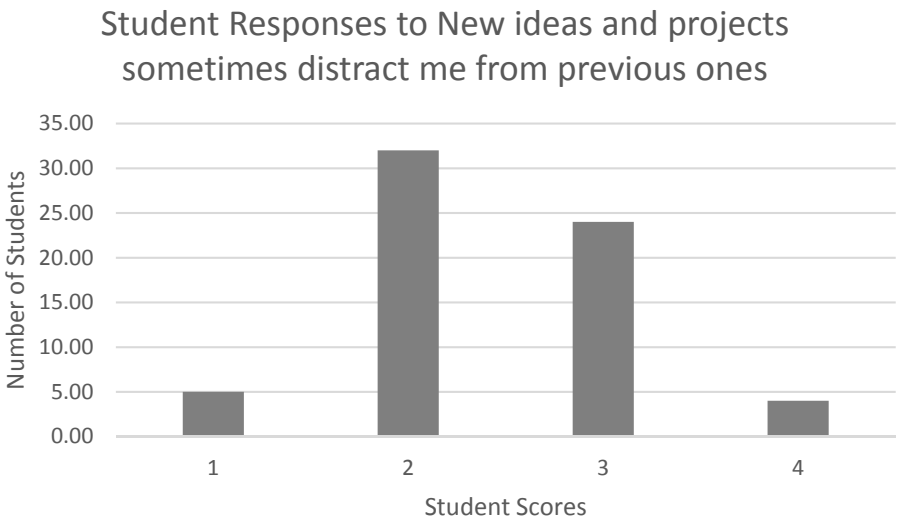


Figure 4.24. Students' scores on the statement *New ideas and projects sometimes distract me from previous ones*

The next statement was *Setbacks don't discourage me*. This item was reverse scored. The median was 3 and the mode was 3 (see Figure 4.25.)

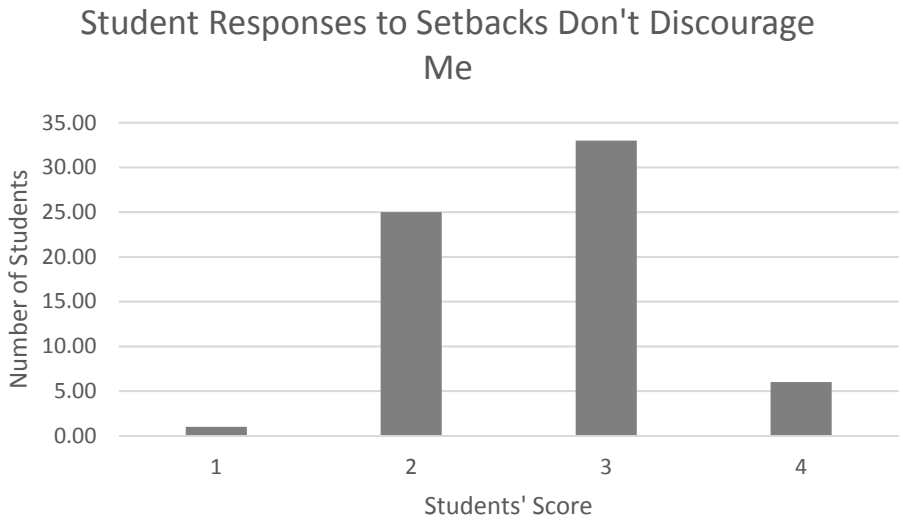


Figure 4.25. Students' scores on the statement *Setbacks don't discourage me.*

The next statement was: *I have been obsessed with a certain idea or project for a short time but later lost interest*. The median was 3 and the mode was 3 (see Figure 4.26). In this example, three is a desirable behavior, and indicates that students do not usually lose interest.

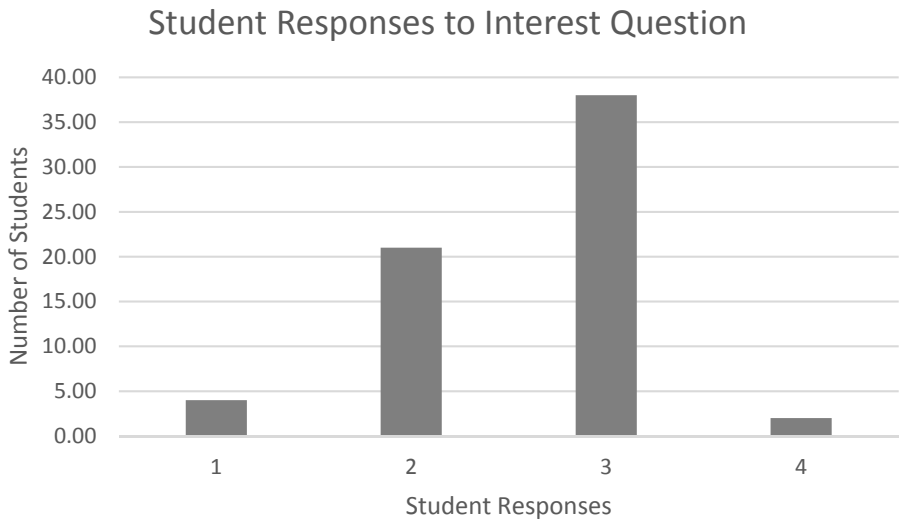


Figure 4.26. Students' scores on the statement *I have been obsessed with a certain idea or project for a short time but later lost interest.*

The next statement was *I am a hard worker* and was reverse scored. This item had the highest median (4) and mode (4) (see Figure 4.27).

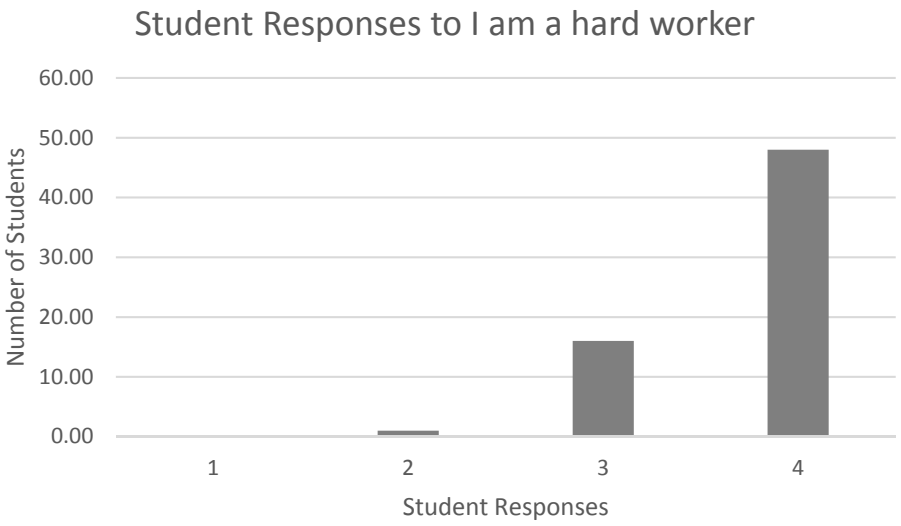


Figure 4.27. Students' scores on the statement *I am a hard worker.*

The next statement was *I often set a goal but later choose to pursue a different one*. The Median was 3 and the Mode was 3 (see Figure 4.28). In this example, three is a desirable behavior, and indicates students do not usually change their goals.

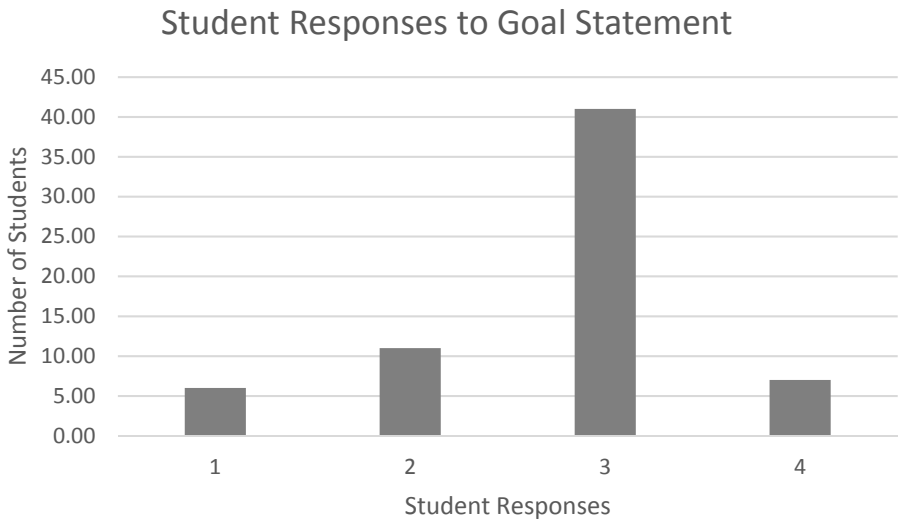


Figure 4.28. Students' scores on the statement *I often set a goal but later choose to pursue a different one.*

The next statement was I have difficulty maintaining my focus on projects that take more than a few months to complete. This item had a Median of 3 and a Mode of 3 (see Figure 4.29).

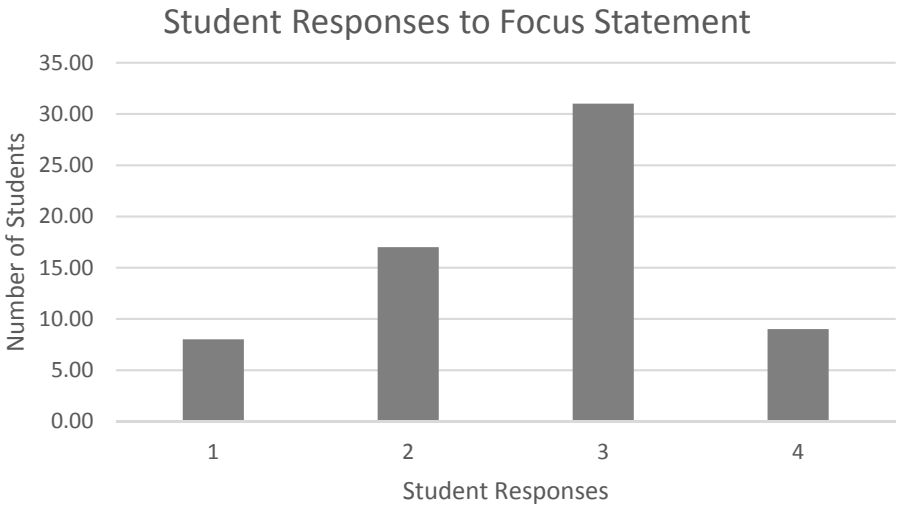


Figure 4.29. Students' scores on *I have difficulty maintaining focus.*

The next statement was *I finish whatever I begin*. This item was reverse scored and had a Median of 3 and Mode of 3 (see Figure 4.30).

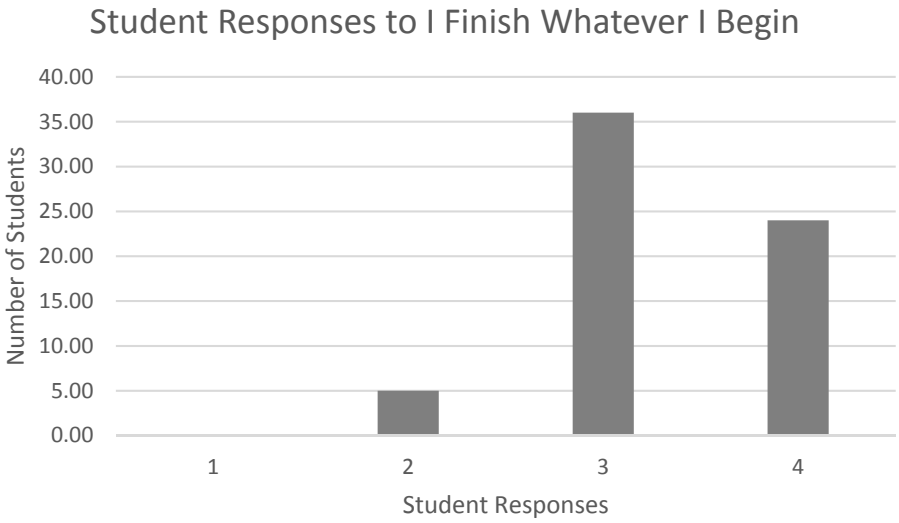


Figure 4.30. Students' scores on *I finish whatever I begin.*

The next statement was *I am diligent*. This item was reverse scored and had a Median of 3and Mode of 3 (see Figure 4.31).

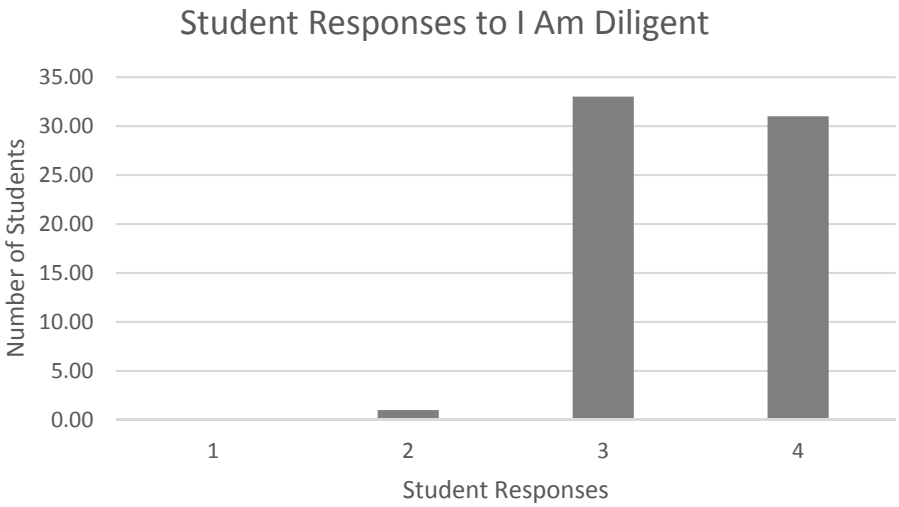


Figure 4.31. Students' scores on the statement *I am diligent.*

Overall, the students' scores reflected very desirable behaviors perhaps because the students were already admitted to a Research 1 institution and most were graduate students. As a result, the GRIT scale was not a good predictor of student success/completion of an online course with this demographic. More research is needed to determine if the GRIT scale could be a predictor of success in an online course with other demographic populations.

Performance Indicator of Students' Technology Proficiency: SmarterMeasure

Recall the SmarterMeasure instrument (see Appendix B). Two sections of this measure were used to assess students pre and post course, the Technical Competency and Technical Knowledge sections. The Technical Competency section had a total of nine tasks, but only eight of those tasks were assessed. The data was retrieved from SmarterMeasure and sent to me as a .csv file. The missing item was not included in the

data sent by SmarterMeasure. The Technical Knowledge had a total of 19 questions, but two were very similar to two questions from the demographic survey so I did not analyze these two questions from the Technical Knowledge survey.

Technical Competency pre-test scores.

Students could earn a maximum of eight points on the Technical Competency section. The majority of students (95.4%, n=62) scored a seven or eight on the pretest which did not leave much room for improvement on the posttest. In fact, no students received a score lower than 5 (see Table 4.6 for the frequency of scores).

Table 4.6

Frequency of Student Scores on the Pretest Technical Competency Section of the SmarterMeasure Readiness Indicator

Points Possible	Number of Students
1	0
2	0
3	0
4	0
5	2
6	1
7	18
8	44
Total # Students	65

Technical Competency posttest scores.

Fewer students (n=50) completed the posttest Technology Competency section. Still, a majority of the students scored a seven or eight, but this percentage dropped from 95.4% to 94%. See Table 4.7 for posttest scores.

Table 4.7

Students' Posttest Technical Competency scores on the SmarterMeasure Readiness Indicator.

Points Possible	Number of Students
1	0
2	0
3	0
4	0
5	0
6	3
7	9
8	38
Total # Students	50

Self-Report of Student Abilities: SmarterMeasure-Technical Knowledge

The other section of the SmarterMeasure Indicator that was of interest was the Technology Knowledge Section. This section asked students to answer questions about 1) the purposes for which they use technology, 2) what types of devices they use, 3) to what extent they can navigate software, hardware, and the internet as well as 4) questions about common technology-related vocabulary.

Pre-Test and Posttest scores on Technical Knowledge section.

The maximum score on the SmarterMeasure Technical Knowledge measure was a 50. The minimum student score was 23 and the maximum score was 49. The median was 35 and the mode was 37 (see Figure 4.32). Fifty students completed the Technical Knowledge posttest. Their scores ranged from 25 to 48. The median was 36 and the mode was 36. This was a slight increase over the pretest median (35) (see Figure 4.32).

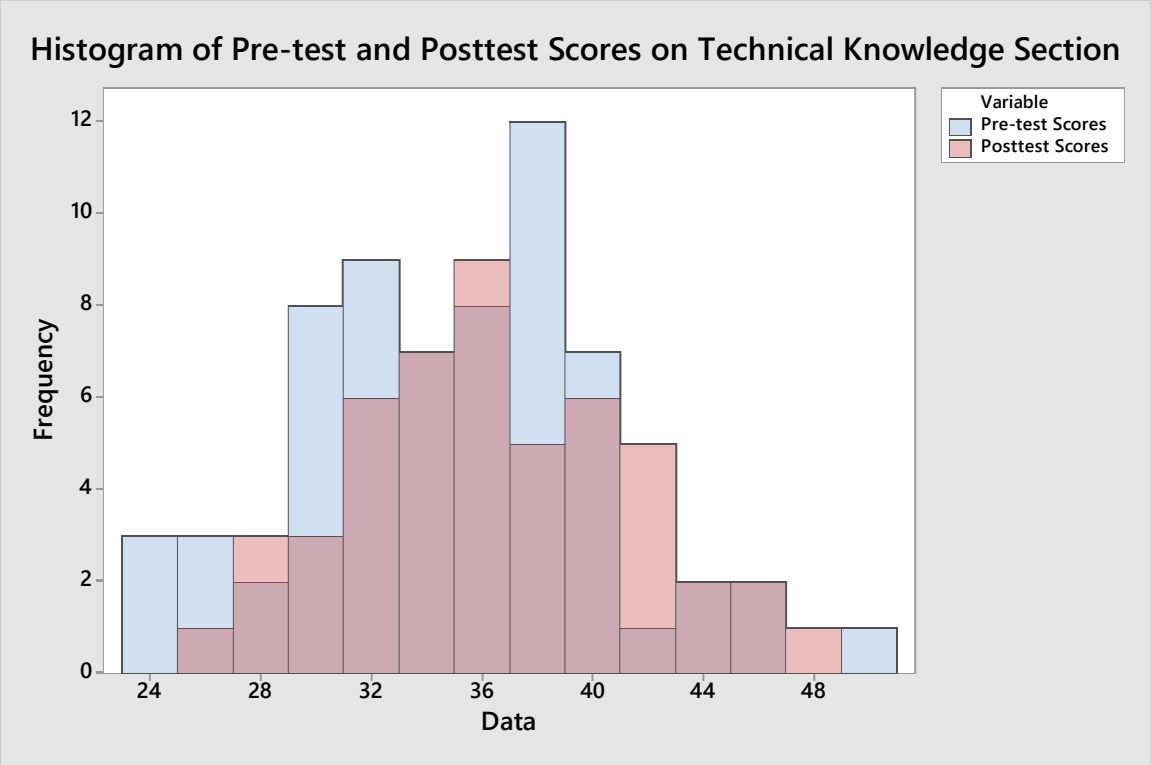


Figure 4.32. Students' Posttest scores on the Technical Knowledge Smarter Measure Readiness Indicator.

In order to answer Research Question 1, it is important that the Introduction to Online Learning mini-course content aligns with students' technology skills and needs. Table 4.8 identifies the mini-course content and aligns it with the SmarterMesure Indicator items. For items assessed with the SmarterMeasure indicator, the number of

students who answered the question correctly on the pretest is listed. By reviewing the number of students who successfully completed each item, the course can be revised to include content that addresses student skill gaps.

The students' strongest skills were using email (n=64) and attaching files to an email (n=65), saving files (n=65), printing files (n=64), using a search engine (n=64), using emoticons (n=64) and knowing the definitions for blogs and logins (n=65). In order to determine which skills students struggled with the most, I decided if less than 90% of the students (n<59) did not correctly answer the topic, then that is an area of need. The areas students struggled with the most include how to open a file (n=55), correctly identifying which software to use to complete a specific task (n=54), using pdfs (n=31), using word processing (n=56), hardware/troubleshooting (n=47), Internet (n=41), internet service provider (ISP) (n=58), and proctoring (n=48).

Table 4.8

Alignment of Technology Course Content and Student Skills as Measured with the SmarterMeasure Indicator Technology Competency and Technology Knowledge Sections.

Technology Related Content in the Mini-Course	Smarter Measure Technology Items	Number of Students Who Demonstrated They Were Experienced In Each Content Area of the SmarterMeasure Pretest (n=)
Using PDFs	Using PDFs	5
	Hardware/Troubleshooting	12

Table 4.8 Continued

	Software Usage	14
File Management	File Management	17
	Using Word Processing	23
(Not taught, but skill students used in course)	Internet	27
	Identify Correct Software Application to Use	54
	Open a File	55
Create/Respond to a Discussion Board	Create/Respond to Discussion Board	63
Sending an Email	Using Email	64
	Print a File	64
Search Engine	Use a Search Engine	64
	Identify an Email Attachment	65
Saving Course Files	Save Files	65
Installing Software		
Using JING/Video Capture Software		
Taking Quizzes in LMS		
LMS		

Note: Grey areas under the "Technology Related Content in the Mini-Course" column were not included in the mini-course. Grey areas under the "SmarterMeasure Technology Items" column were not assessed on the SmarterMeasure Indicator and therefore no scores are listed in column "Number of Students Who Correctly Answered Questions on SmarterMeasure Pre-test(n=)".

Table 4.9

Alignment of Technology Course Content and Student Understanding as Measured with the SmarterMeasure Indicator Technology Competency and Technology Knowledge Sections.

Technology Related Content in the Mini-Course	Smarter Measure Technology Items	Number of Students Who Chose the Correct Definition for Each Term (N=)
Proctoring	Proctor (definition only)	48
	ISP (definition only)	58
Netiquette	Netiquette (definition only)	60
	Computer Virus (definition only)	63
Browser	Browser (definition only)	63
	Emoticon (definition only)	64
	Blog (definition only)	65
	Login (definition only)	65

Since the students in the study demonstrated pre-existing skills with using email, attaching files to an email, saving files, printing files, using a search engine, using emoticons and knowing the definitions for blogs and logins, it is not worthwhile to

include these items in the course. Currently, only using email and saving files are included in the mini-course, but it may be worth excluding these in the future.

Students were less skilled with opening a file. This could be due to the ever-changing interfaces as a result of version upgrades, a difference in operating systems, or because there are multiple ways to complete this task and students may have found a preferred alternative method. Currently, this topic is not in the mini-course. This is such a low-level task that I don't think it is necessary to include this in the mini-course in the future. It is interesting that the students were not certain about what software to use to complete a specific task. In the future, I can look at ways to address this in the mini-course.

While students have to download, save, and attach a pdf using the assignment feature in their LMS, the course did not teach students how to use any advanced features of pdfs. More information is needed to determine if these are features students need to learn to be successful in their online courses.

Other than providing direction to students about where to download a free copy of Microsoft 365 from the institution's website, no other word processing skills were addressed in the course. It may be helpful to some students to provide a short module about some of the most advanced feature of word processing, such as using tables, text boxes, page numbers, etc.

The item about hardware and troubleshooting is more relevant to PC owners who can upgrade hardware components. Since the majority of the students in this study own a laptop, they are limited in their ability to upgrade hardware components. It is important, however, for students to know they can troubleshoot problems on their own. Many of the

software manufacturers have their own support pages. In addition, many other technology questions have already been answered online in discussion board forums. It is worth considering how to integrate troubleshooting skills into the mini-course.

While students know how to use the internet for social media and accessing their LMS, they are less skilled at using it to customize their search experience as well as their computer. Instructions on how to download plugins and software such as Java, Adobe Flash, Adobe Reader, and Mozilla Firefox are included in this course as well as information about setting preferences so that these tools will automatically update.

The internet service provider (ISP) question was so rudimentary, although important, is of little relevance to the students. While the mini-course does not use proctoring, there is a unit that discussed the proctoring options available to instructors and with which students need to be familiar.

Overall, while students perceived they are technologically advanced in applications such as word processing, as indicated by the demographic measure that asked students to identify how much help students needed with a variety of software applications, the SmarterMeasure assessment reveals otherwise. The SmarterMeasure assessment indicates students are only moderately technologically skilled. The median score on the SmarterMeasure pretest was a 35 out of 50 or 70%. This indicates there is a need for the Introduction to Online Learning mini-course to help better prepare students for learning online. Slight adjustments to the course will help it better meet the students' areas of greatest need in the future.

Research Question 2: How adaptable was the existing institutional online education system to integrating an orientation to online learning mini-course?

The original research design for this study pertained only to the instructional design model of the orientation to online learning course. Over time it became apparent that the recruitment process was an unobtrusive measure stemming from an unanticipated insight that developed from the conduct of this study related to the implementation of any orientation to online learning course. Thus, following Stake's lead of "there is no particular moment when data analysis begins" (Stake, 1995, p. 71), I began to analyze why I was having such difficulty finding an institution who would implement the course and discovered that the institutions, themselves, were study participants. Table 4.10 is the timeline for the study previously presented in Chapter 3 as a point of reference for readability and references to the various institutions with which I engaged over almost three years to provide the Introduction to Online Learning orientation mini-course.

Table 4.10

Timeline of Study

Date	Activity
Fall 2012 Semester	Began working on IRB Process and course development for Institution 1
December 20, 2012	Received approval from UK IRB Protocol #12-0942-P4S
Spring 2013	Course was not offered at Institution 1
Spring 2014	New course was created for Institution 2 & IRB Modification approved
Fall 2014	Course not offered at Institution 2
Spring 2015	Course Redevelopment for Institution 3 & IRB Modification approved
Late-Spring 2015	Course offered at Institution 3 (limited participation)
Later Spring 2015	Course Redevelopment for Institution 4 & IRB Modification approved
Week Prior to Summer 2015	Consent Form Distribution to Instructors at Institution 4
Summer 2015	Data Collection at Institution 4
Week Prior to Fall 2015	Consent Form Distribution to Instructors
Fall 2016	Data Collection at Institution 4

The following section is an overview of the relationships, correspondence, and implementation challenges we faced at each institution.

Institution 1.

Institution 1 was a community college in the Midwest. My contact was a Vice President at the college. I discussed my interest in conducting a study that implemented PSI and ML instructional design elements. The contact person suggested I redesign one of their online courses. Each of their online courses goes through a re-design every few

years. They suggested I design a mastery-style version of their existing introductory to online technologies course while it went through the redesign phase. I worked with the instructional designer (ID) who was assigned to the course and was simultaneously redesigning the traditional online version. While I was working on the redesign, I also collected control data on the original online version of the online technologies course. I planned to offer the first mastery-style online technologies course in the Spring of 2013.

Two weeks prior to the start of the course I found out there were no instructors for the course. The administrator advised that I go directly to the affiliated campuses/regions offering the traditional online version of the OLT course and ask them to participate. This solution posed a couple of problems: 1) I did not know anybody in the regions offering the course which meant I would need to start from the beginning of the implementation process. Greenhalgh et al.(2004) said "Even so-called evidence-based innovations undergo a lengthy period of negotiation among potential adopters, in which their meaning is discussed, contested, and reframed" (p. 594) and 2) to complicate matters, the institution was undergoing a reorganization. Regions were merging, positions were being realigned and eliminated and it wasn't clear who to approach. It was clear this institution did not meet the criteria for system readiness.

Institution 2.

Institution 2 was a community college in the southeast. I learned of them through a common professional relationship. The contact person was an Executive Vice President. I had a lengthy in-person conversation and several emails back and forth over the next four months. During this time, I developed a new 2-week orientation to online learning course that utilized their LMS and pointed students to their resources. Overtime

it became more difficult to reach my contact person and eventually all communications ceased. With my advisor's approval, I decided to look for another place to do the study.

Institution 3.

Institution 3 was a small university in the southeast. I was interested in this university because they offered a large number of associate, bachelor, and graduate online-only degrees. Our contact person was an instructional designer who was also in charge of the online education department. I approached her about the 2-week long orientation to online learning course. She was very enthusiastic about the course and helped to get us in front of administrators on campus. They underwent a recent restructuring after the college suffered some financial losses and I thought they would be motivated to adopt this intervention in order to help improve their reputation with students.

While talking with the administrators, I discovered they were in the beginning stages of creating an orientation program for new students. I offered to help them with the online learning component of that program by embedding this course into their orientation, however, they were not interested. In terms of system readiness; they weren't prepared to think about including an online learning component in their orientation course, even while they were trying to rebrand their name as a credible institution for online learning.

While the administrators were not ready, the instructional designer was. After the approval of the institution's version of the IRB, I did offer a 2-week not-for-credit orientation to online learning course to students new to online courses at the institution. Since our institutional support was minimal, only a small number of students participated.

Because it appeared not many students were interested in taking the course, I decided to approach another institution with the hope I could implement to a larger audience.

Institution 4.

Institution 4 is a large land-grant university in the southeast. I first approached the institution's department that provides instructional resources, workshops, and consultations for faculty. They were interested in the orientation for online learning course, but would not consider advocating for the course until a full review and evaluation of the course had been conducted. In order to expedite the process, I instead turned to the Associate Dean of one college who had an interest in student retention. While she was very supportive of the study, again, the institution was not prepared for the required level of systems implementation. I was redirected to asking individual instructors to participate in the study. Thankfully, the instructors were very enthusiastic and supportive of the study. These professors and instructors were teaching an online course during the summer. All of the faculty I approached agreed to participate in the study and allowed me to ask their students to participate.

Based on the amount of interest I had in the course, I offered the course again during the Fall 2015 semester. Midway through the semester, after looking at the participants' demographics I realized very few of the students were new freshmen, so with the help of my advisor, I approached another faculty member who was in charge of one college's version of the freshmen orientation course. The faculty member advocated for use of the orientation in the student development course and introduced us to those instructors. The majority of our freshmen participants came from those student development courses.

Use of Implementation Science as a Conceptual Lens for Analysis.

Implementation Science seemed to provide a reasonable framework to examine this dimension of the case. The overall implementation science model developed by Greenhalgh et al. (2004) was presented in Chapter 2 (see Figure 2.2). I focused specifically on the User System component of the model, in particular the System Readiness for Innovation including Dedicated Time and Resources and Tension for Change, Assimilation/Dissemination, and Implementation phases of the framework to further analyze the recruitment experience.

System Readiness for Innovation-Dedicated Time and Resources.

Conducting research in a college/university setting poses many problems. There are many details to negotiate before being able to conduct the study. The institution that participated in the study was one of four in the Midwest and Southeast with which I had negotiated participation. While I received initial support from all four institutions and approval from the three Institutional Review Boards to which I applied, only student data from a four-year, land grant university setting in the Southeast are included in the study. At Institution 1, student control data was collected from a 16 week, 1 credit hour course that "prepares students for online learning and training opportunities in the workplace" (Institution 1/College Course Catalog-identity withheld to protect privacy). However, the mastery learning version of the course I designed was never offered.

In order to protect the intellectual property of Institution 1, I built a new orientation to online learning course with new objectives and activities for Institution 2. After months of planning for and scheduling the implementation, for reasons still unknown to the researcher, communications abruptly cease and neither my advisor nor I

could get in communication with our point of contact. Institution 3 was interested in the course, but indicated they needed a shorter non-credit version of the course. I then designed the course intended for Institution 2 into a 2-week course that was offered at Institution 3. A small number of students took that course. Institution 4 requested an even shorter version of the course. I then redesigned the 2-week course into a 3-4 hour long non-credit course. A total of 208 participants from Institution 4 participated in the study of which 65 completed the course.

System Readiness for Innovation-Tension for Change.

According to Greenhalgh et al. (2004), when a current situation is perceived as "intolerable" then the system is more likely to adopt an innovation (p. 607). In recent years, college attrition rates, particularly those measuring the percentage of undergraduates who graduate within six years are getting more attention. The policy paper by Raisman (2013) makes a financial case for why colleges and universities should intervene to prevent the situations that cause students to drop out. "Retention" and "attrition" are common terms at institutions and as a result, it may be a good time to address retention and attrition in online courses. While there is substantial discourse in the education field about attrition, I did not feel a sense of urgency from any of the institutions I attempted to recruit. They did not express any concerns of financial loss, student attrition, or extended time to graduation as it pertained to online courses.

Assimilation/Dissemination.

The original intent was for the mini-course to be included as a module placed within the instructor's and student's for-credit course and for the instructor of that course to document all the students' requests for assistance, assignments, etc. A week before the

course began at Institution 4, the instructors requested this be a stand-alone mini-course that was taught externally from their course and had a separate instructor. At the last minute, I stepped in to teach the course I designed. While I tried to not focus on being the researcher and designer while I was fulfilling the instructor role for the course, there was potential for researcher bias.

Implementation.

Implementation proved to be the most difficult aspect of the study. Depending on the institution, I gained access to different types of staff. At Institutions 1 and 2 I dealt directly with executive administrators who oversaw the online programs. At Institutions 3 I worked with a staff member who, while not part of the executive team, did oversee the online education department. At Institution 4, I worked with an Associate Dean for Undergraduate Programs. While each individual was supportive of our project, their level of advocacy was limited.

Research Question 3: How do students with previous experience perceive the orientation to online learning mini-course?

Student Reactions to the Course.

On the post course survey, students were asked to identify the aspects of the course they found most beneficial, least beneficial, and any other comments they wanted to share. Here is a summary of the findings:

Student reactions to what was most beneficial about the course.

Students identified that they found the most beneficial features of the course were the units on using JING/screen capture, using the online library, making updates and

downloading software to their computer. A Cohen's Kappa measure of inter-rater reliability indicated an 83.60% agreement.

Student Reactions to what was least beneficial about the course.

Nine students found the discussion board unit the least helpful part of the course. Eleven students responded that they either "already knew all of the content" or they "already knew how to do everything". The Cohen's Kappa measure of inter-rater reliability for the posttest open-response question asking students to identify the least helpful parts of the course was 78.03%.

Students' suggestions and comments to open-ended posttest question.

Students' comments were mostly positive. The criticisms were overwhelming constructive and did not deny the need for such a course. The Cohen's Kappa measure of inter-rater reliability for the posttest open-response question asking for other comments, was 81.51%.

Students' Positive Comments.

- Course was simple, easy to navigate
- Good for freshman but not for individuals who have used canvas and blackboard before. It was a waste of time and a lot of waiting around while things needed to be graded.
- It would be interesting to see how much outside factors play into students dropping out or failing a course.
- I think this course, expanding over an appropriate amount of time, would greatly help students who are new to online learning.
- I think that this would be a good course for XX101 and freshman students.

- This course was helpful, and I am glad I took it.
- Great way to introduce students to the online component
- Great course!

Students' Criticisms/Suggestions.

- The course took longer than expected.
- Students should be able to continue working without waiting for grading. Some time limits made it stressful.
- Not a fan of this mini course; especially when everyone in this class are graduate students and more than likely have used blackboard extensively in their undergraduate studies.
- While I understand the point of this overview, it is not something that needs to be given to people in a graduate level course. Maybe for Freshman just entering college.
- More about getting help online
- I wish the course could be completed quicker. Having to wait for grading and responses really slowed progress. I realize that it is a necessary piece, but if it could be streamlined, it would be helpful.

Students' Reactions to Overall Value of the Course

Overall, the majority of students found the course to be *A little* or *Somewhat* beneficial (see Figure 4.33).

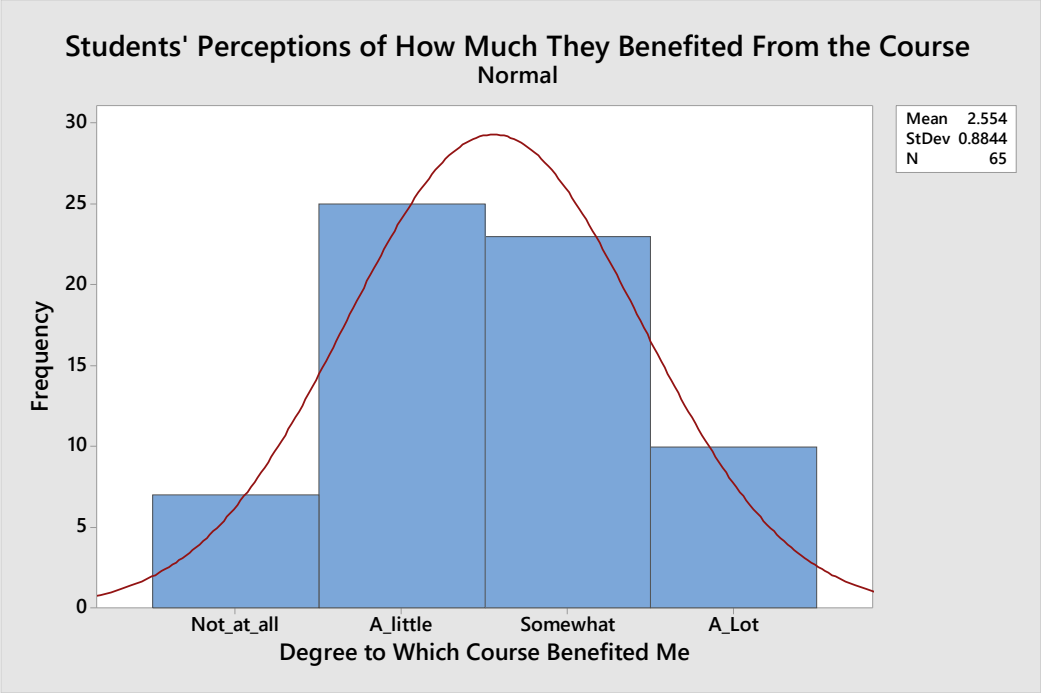
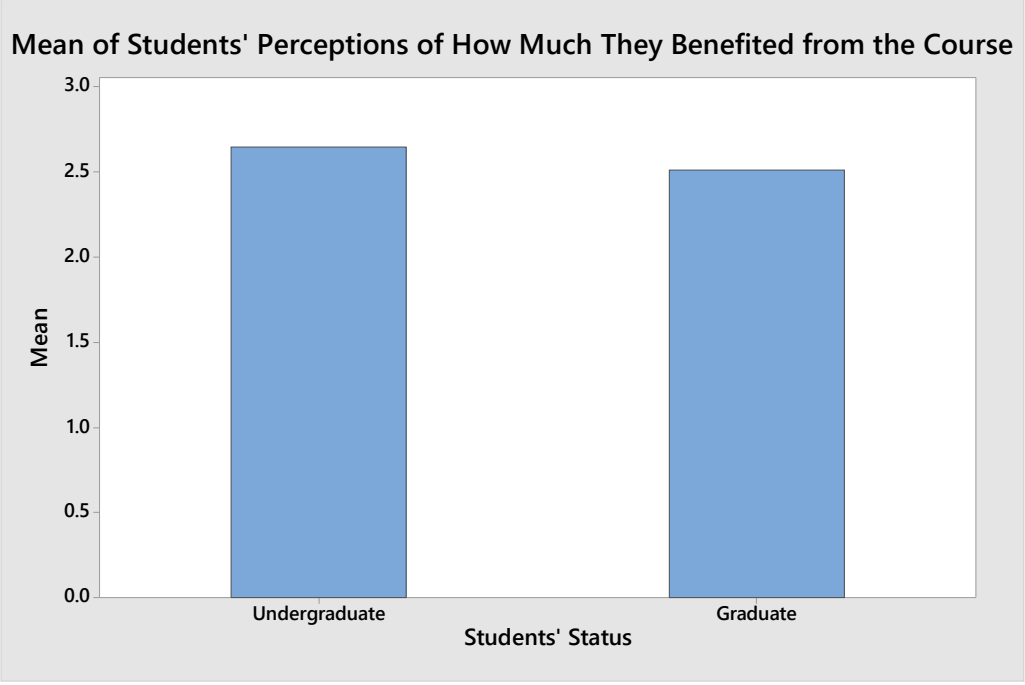


Figure 4.33. Students' Perceptions of How Much They Benefited from the mini-course.

Interestingly, this perception did not vary much between undergraduate and graduate students. They had similar perceptions about the value of the course.



Response Time

Both in the open-ended comments and the open-ended question about what was least helpful about the course students remarked about the time it took them to progress through the course. Students desired the opportunity to sit down and take the course without having to wait for the instructor to respond or grade their work. The course was built so that students had to complete numerous authentic assessments. Students were required to demonstrate that they could successfully complete each activity rather than just answer multiple choice questions about it. As a result, most of these assignments required manual grading. Therefore, the students had to wait for the instructor to grade their work to verify that they mastered the assignment before they could move on to the next unit. Depending on the assignment, the average response time ranged from 2 hours and 49 minutes to 6 hours and 55 minutes. See Table 4.11 for an analysis of the average response time for each assignment.

Table 4.11

Time it took the instructor to grade

Assignment	Average Response Time (H:MM)
Email Assignment	5:27
Practice Test	5:45
Discussion Board 1	6:49
Discussion Board 2	4:02
Online Library/JING	6: 55
Assignment Upload	2:49

Students' Email Requests for Assistance.

There were a total of 91 requests for help. When emails included multiple requests, each request was counted separately. There were sixteen requests regarding issues students were having with progressing forward through the course. Ten requests were questions students had about instructions in the course. How to find the course was the third most frequently asked question. The majority of these students enrolled during the late registration period and were not on the original roster I received from the for-credit course instructor. Once the issue was identified, they were manually enrolled. The Cohen's Kappa reliability for students' requests for assistance was 79.19%. In the next chapter I discuss these results, make a case for an orientation to online learning course, and make suggestions for future research.

Several measures were used to ascertain students' technology skills and needs. Overall, even though the majority of students had taken an online course prior to participating in this study, the self-assessment of their technology skills and experience indicated they were experienced enough to help others with consumer-types of software applications. There remain questions and concerns about students' skills gaps. The students primarily use technology for the consumption of digital content. They are not digital content producers. When evaluated using the SmarterMeasure Technology Knowledge measure, it became apparent that there are gaps in their technology skills knowledge and ability. Students indicated in their self-assessment that they were able to complete complex tasks, but the data does not support that. Therefore, to the extent that the SmarterMeasure tasks objectively measure the knowledge and ability of the student in

the online learning environment, it is important to continue to include these modules in the Introduction to Online Learning orientation course.

In all, it took approaching four institutions and partially implementing this course at two institutions to get enough participants for this study. None of the institutions met the criteria of full system readiness even though the course met most of the design criteria of the Implementation Science model (Greenhalgh et al., 2004).

Overall, the students had positive responses to the course. They liked the modules about the JING screen capture/video and using the online library the most. These modules introduced students to new ways to use technology to which they had not been previously exposed. Students least liked the modules on using the email and discussion board tools inside the LMS. Their responses indicated that they were already familiar with these tools. Students were familiar with the tools in the course commented that some modules may have been redundant for them. However, many students suggested that they believed the course had value in the college setting. Many of the comments suggested such a course would be ideal for freshmen. Students reported few problems with the course, but they did recommend making the course faster-paced so that they could complete it without having to wait for grading.

Overall, given multiple measures of students' skills and needs, the course content was a close match even though some students thought they didn't need the course. This is consistent with Bozarth, Chapman, and LaMonica (2004) who stated that students "assess their skills as much higher than what the instructors are actually witnessing" (p. 102). Chapter 5 is a discussion of the implications and needs for further research.

Chapter 5-Discussion and Implications for Future Research

For over a decade, post-secondary institutions have been experiencing increases in online course enrollment. Unfortunately, while online course enrollment is increasing, colleges and universities are reporting a higher rate of attrition in online courses as compared to traditional face-to-face classes. In many cases online course attrition is 20% higher than in the traditional face-to-face version of the course (Aragon & Johnson, 2008, p. 146).

Two reasons that students report for dropping an online course are problems with technology and course design issues. In one study, 80% of students who dropped an online course reported issues related to personal time, course design and communication, or technology as the reasons they did not complete the course (Aragon & Johnson, 2008, pp. 151–152). Dupin-Bryant's (2004) research makes the case for a mandatory orientation to online learning course.

Even in this study, where 73.85% (n=48) of the students had previously taken an online course, nearly a tenth of them (9.2%, n=6) had also dropped an online course. The most frequently given reason for why students dropped was that the course was more advanced than they were prepared for. The other reason was that the course took too much time.

This chapter is an opportunity to review the findings from chapter four. Those findings reveal whether the students' skills and needs match with the content of the course. The results indicate how adaptable the existing institutional online education systems are to integrating an orientation to online learning mini-course, and how students perceive the orientation to online learning course.

Students' skills and competencies

The students in this study are largely consumers of digital content and active in social media. The data demonstrate students have basic skills, particularly in word processing, email applications, in their LMS and social media. They are not creators of digital content and do not necessarily have the skills needed to troubleshoot problems they may encounter when preparing for and taking their online course.

It appears that students perceive they are more technologically advanced than what they demonstrate when asked which specific tasks they can complete. This finding is consistent with Bozarth, Chapman, and LaMonica (2004) who found "a large gap between what students believed their proficiency skills to be and what instructors actually experienced in online learning situations. Students assessed their skills as much higher than what instructors were actually witnessing" (p. 102). For example, students in this study did well on Technical Competency such as basic "how to" questions pertaining to saving files, sending email attachments, printing, etc. The students did not do nearly as well on Technical Knowledge questions when students were asked to indicate whether or not they could complete more specific and advanced tasks. For example, while 46% of students said they were experienced enough to "help other people" with Adobe Acrobat on the demographic questionnaire, only 7.7% of students indicated they could use advanced features of PDF files on the SmarterMeasure. Students also found Hardware/Troubleshooting (N=12), Software Usage (n=14) and file management (n=17) more difficult. This is consistent with a quantitative study using Rasch Rack and Stack Analysis of a subset (n=15) of the 65 participants (Sampson, Arrowsmith, Bradley & Mensah, 2016). In this study, students also indicated they were able to "help other

people" with Adobe Acrobat but when analyzed according to the SmarterMeasure Indicator, PDF was the most difficult item for students to endorse, along with Internet, Email, and file management.

Relevance of the content included in the course

Even though the students in this study perceived they have advanced technology skills, the data suggests otherwise. As a result, the content of the Introduction to Online Learning course is relevant with the exception of the email and the discussion board modules.

Because of the students' reactions, further research is needed to determine if the two aforementioned units (email and discussion board modules) are appropriate for first time online students. The email and discussion board modules may need to include more advanced lessons for the proficient user or students may need to have the option to test out of taking these modules altogether. Perhaps other options exist to 'customize' the coursework, through adaptive release or other options in newer LMSs. Students were neutral towards other LMS-related content in the course such as the practice test and test questions.

While most students in this study perceived their technology skills as being more advanced than the data indicated. It is important to consider the value of creating a needs assessment to determine if a student needs to take the Introduction to Online Learning orientation mini-course. Students who already possess the learner characteristics and technology skills to succeed in an online course will not perceive the course to be of value to them. In addition, by narrowing the audience of the course the instructional

designer can better focus on the needs and the interests of the novice learner and not have to also design a course that is of interest and value to the advanced learner.

For those who perceive themselves as being more advanced and not in need of an orientation course contradictory to the results of a needs-assessment, it may be necessary to reframe the course so it is not perceived as an "orientation" course, but rather a way to develop their online identity or find their "voice" in the online environment. Collison, Elbaum, Haavind, &Tinker (2000) wrote extensively about the instructor's use of voice in the classroom, but it is also important for students' use of voice to be considered.

Using the online library and JING modules.

In addition to content that taught students how to use the LMS, there was content related to how to use the online library, identify scholarly sources, and avoid plagiarism by citing sources. Students seemed to find these units the most beneficial units of the course. Libraries are offering fewer hard-copy resources and are instead sending students to their online databases to find online articles and digital resources. In order to meet the demands and rigor of students' college classes, students must learn how to use these resources as they cannot rely on popular search engines such as Yahoo!, Google, and websites such as Wikipedia to find scholarly sources.

JING (JING, n.d.) was another tool and feature of the course students enjoyed the most. In an age when more students communicate with video and pictures through the use of applications such as Instagram, and Snapchat, I thought it was important to show students how they can use screen capture and video to communicate in their courses and create digital content. A few students found the tool too simple and basic. However, the point of the module was to find and use a tool that students could quickly learn how to

use to capture images and video. JING is a free tool that is easy to download and use and available for Mac and PC. While there are other ways to produce screen captures and video, they are often not as simple, or universal. My goal for including the screen capture/video unit in the course was two-fold: 1) I wanted students to learn how to effectively communicate their issue or question with their instructor, Information Technology (IT), and other classmates with an image instead of only with a narrative explanation and 2) when students learn how to make short videos and take screen captures, it provides alternative ways for instructors to assess and evaluate students' work in an online course.

Overall, students had either positive comments or constructive suggestions for improving the Introduction to Online Learning mini-course. Generally, they thought the course would be better suited for freshmen who were new to the institution, the LMS, and the tools and resources available on campus. They did not like the modules about using the email and discussion board features within the LMS, however, they did like some of the more advanced features of the course such as the module about the online library and using JING/screen-capture/video.

Discussion of the Use of the GRIT Scale

Overall, the GRIT scale was not helpful in this study. Two studies had similar findings. Jaeger, Freeman, Whalen and Payne (2010) explained "there were no significant differences found statistically for the graduation year 2010, the seniors as compared to other academic levels" (p.10) and Chang (2014) described "grit as a composite score did not significantly explain academic performance in the first year of college" (p.47). The GRIT scale may be more useful if used with incoming freshmen, particularly with

populations who are at-risk for not completing college, such as first generation college students and non-traditional students. In addition, more research is needed to determine if the GRIT scale could be used with students enrolled in community colleges where the online course attrition rates tend to be much higher than face-to-face course attrition rates. It is probable that the GRIT Scale, by itself, may not be predictive of student success however. Tinto (1975) created a model to predict student success in higher education that included many different factors and has been widely adapted by the online learning community. However, Dupin-Bryant (2004) suggests taking so many variables into account in order to gain a holistic understanding of the student can, in fact, be crippling to the research in this area. Currently, the research community is searching for a balance between too many variables and not enough.

Use of a modified mastery instructional design model for the online learning mini-course

Having the knowledge and skills to overcome technological barriers is critical to success in an online class. Because this knowledge is so critical, I chose to implement a modified mastery learning model based on elements of PSI and ML in which students had to demonstrate mastery of these skills before moving to the next unit (Guskey, 1997; Keller, 1968). As a result, traditional multiple choice, self-graded exams were not the best way to evaluate students' abilities. Instead, I chose to evaluate students through the use of authentic forms of assessment. As a result, students reported waiting for an instructor to grade their work and confirm that they demonstrated mastery of the content took too much time. The students wanted to be able to sit down and complete the course at their own pace. While students reported not liking the mastery model, the students'

complaints with this course are similar to complaints students make about traditional online courses. Bozarth, Chapman, and LaMonica (2004) found in traditional online classes, "a common theme among instructor responses was the misperception among students that online courses would demand only that they log in once a week to get an assignment or provide a posting; instructors reported that students often seemed surprised at the level of interaction and frequency of contact demanded by many courses" (p. 91).

The following considerations should be made when revising the orientation course:

1) One way to respond to the students' concerns of the course taking too much time is to conduct further research into ways to automate responses so students can continue working without having to stop and wait for an instructor to confirm their mastery of the content.

2) Another option would be to offer the course for just a few days and have a variety of instructors working in shifts to cover 18-24 hours a day so that assignments are graded and returned in a matter of minutes rather than hours.

3) Instead of preventing students from accessing additional content while they wait for the instructor to grade their work, perhaps students could view the content of the next unit so they felt like they were still making progress, but prevent students from submitting the next assignment until the previous one had been graded and mastery demonstrated.

4) Another way to address this concern is to modify the self-paced feature of the course to include recommended or required deadlines. Further research is needed to see if it is helpful to be specific about the expectations of self-pacing and telling students that

they need to set aside time everyday to log into their course and work through their assignments until they have met the deadline. By making these expectations clear up-front and including deadlines, it may help to eliminate student procrastination and misconceptions about the pacing of online courses. In future offerings of this mini-course, I could suggest to students that they set aside two 15-minute blocks of time each day to work through the course. This will provide ample time for the instructor to grade the students' assignments and return it before the student works on their second block of time for the day.

Challenges of Implementing an innovation in post-secondary institutions

Implementation Science was a helpful lens for understanding the process required to approach, gain approval for, and implement an intervention in higher education. I found the administrators and institutions were not system-ready to implement this course across the institution. While the administrators were supportive of the research study and intervention, they did not express any needs that demonstrated that there was a "Tension for Change" (Greenhalgh et al., 2004, p. 607). In fact, none of the administrators expressed that they had any problems with attrition, financial loss, or extended time to graduation. As a result, there was not an urgency to advocate for or be actively involved in the implementation of the mini-course. In addition, the institutions weren't forthcoming about the process I needed to follow to recruit administrators, faculty and staff.

Future studies should plan to allow for enough time to negotiate for a full-implementation of the innovation: "even if innovation has relative advantage, innovations undergo a lengthy period of negotiation among potential adopters, in which their meaning

is discussed, contested, and reframed. Such discourse can increase or decrease the innovation's perceived relative advantage" (Greenhalgh et al., 2004, p.594). In addition, researchers should consider acquiring a budget that covers "Dedicated Time and Resources" (p.608). Perhaps, the most imminent concern is whether or not the "organization has tight systems and appropriate skills in place to monitor and evaluate the impact of the innovation" (p.608). If the system doesn't already have this in place, then this might be the first problem that needs to be addressed, because, the lack of systems for evaluation may very well be the reason the institutions isn't aware of the online course attrition problem.

Implications and recommendations for future research

Even though the course was designed as an orientation to online learning, most courses, even face to face ones, are technology-rich and often require students to use the institution's LMS. The units about accessing the library, using JING and knowing how to access the student services available are relevant to all students. I discovered that when the orientation course is voluntary, the study results do not yield substantive contributions to the current field of research. It is important to note that future studies will be relevant only if the mini-course is a requirement of all incoming, first-time freshmen. This is supported in the literature by Bozarth, Chapman, LaMonica (2004, p. 102).

With a representative data set from the target audience for which this course was designed, future research may be able to determine if there is a long-term impact on students who take this course. By following the student participants through the following semester, researchers may be able to determine if students are more likely to

successfully complete future online courses when compared to the institution's average course completion rate.

Future research is needed to develop a single, more robust measure that adequately identifies students' technology skills. This measure should assess how much help a student needs, include a measure similar to SmarterMeasure, and quantify if students are consumers or creators of digital content. Further study into how these variables are operationalized in relation to online course experience is warranted.
In addition to researching the value of the GRIT Scale in future studies, it will also be important to analyze it in the context of other learner characteristics of the successful online learner (such as being goal-oriented) and course structure (such as the use of deadlines vs. self-pacing).

The most interesting facet of this study to me was the unanticipated dimension of the research study that turned out to be not the intervention, but the process of implementing this course in a higher-education institution. It would be interesting to study what motivates higher education administrators to make changes to the curriculum, accept new interventions designed to help students, and to learn why increasing students' retention rates, alone, is not motivating to higher education leaders.

When reviewing the Model of Diffusion in Service Organizations (Greenhalgh et al., 2004) it still seems the course meets most, if not all, of the requirements for successful implementation. The only deficiency may be an "unambiguous advantage in either effectiveness or cost-effectiveness" (p. 594). While I thought the message of increasing students' retention in online classes spoke for itself, perhaps, in the future a stronger and clearer message that speaks to the cost effectiveness of retaining students in

addition to the obvious moral goal of doing it simply because *it is what is right for the students.*

Conclusions

This single holistic case study further supports existing research that demonstrates a need for an orientation to online learning course for new online learners. In addition, this study reveals that Implementation Science, generally used in the health sciences is relevant to post-secondary institutions and deserves more consideration when proposing new programs that could mitigate issues such as the increasing attrition in online course enrollment. Future researchers should further investigate the diffusion of innovation in post-secondary institutions to find out how to more successfully implement an orientation to online learning.

Appendix A

GRIT Scale (Short-Version)
(Duckworth & Quinn, 2009)

1. I often set a goal but later choose to pursue a different one.
2. New ideas and projects sometimes distract me from previous ones.
3. I have been obsessed with a certain idea or project for a short time but later lost interest.
4. I have difficulty maintaining my focus on projects that take more than a few months to complete.
5. I finish whatever I begin.
6. Setbacks don't discourage me.
7. I am a hard worker.
8. I am diligent.

Appendix B

SmarterMeasure Survey Categories

Category	Sub-Categories/Topics
Individual Attributes	Procrastination
	Time Management
	Persistence
	Willingness to Ask for Help
	Academic Attributes
	Locus of Control
Life Factors	Availability of Time to Study
	Availability of a Dedicated Place to Study
	Reason for Continuing One's Education
	Support Resources from Family, Friends, and Employers
	Perception of Academic Skills
Learning Styles	Identifies the degree to which they possess each of the following learning styles:
	Visual
	Verbal
	Social
	Solitary
	Physical
	Aural
	Logical
Reading Skills	Reading Rate
	On-Screen Reading Recall
Technical Knowledge	Technology Usage
	Technology in Your Life
	Technology Vocabulary
	Personal Computer/Internet Specifications
Technical Competency	Computer Competency
	Internet Competency
Typing Skills	Typing Rate
	Typing Accuracy

Appendix C

IRB Letter of Approval

UNIVERSITY OF KENTUCKY

Office of Research Integrity
IRB, IACUC, RDRC
315 Kinkead Hall
Lexington, KY 40506-0057
859 257-9428
fax 859 257-8995
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Initial Review

Approval Ends
December 19, 2013

IRB Number
12-0942-P4S

TO: Heather Arrowsmith
Education
10226 Bonear Ct.
Evansville, IN 47711
PI phone #: (859) 494-8101

FROM: Chairperson/Vice Chairperson
Non-medical Institutional Review Board (IRB)

SUBJECT: Approval of Protocol Number 12-0942-P4S

DATE: December 20, 2012

On December 20, 2012, the Non-medical Institutional Review Board approved your protocol entitled:

Designing Instruction to Decrease Attrition in Online Classes

PLEASE NOTE: This approval is contingent on any approval or other requirements placed on you via the review process at Ivy Tech. If that process compels you to modify your protocol please contact the UK IRB immediately before proceeding. If you receive an approval letter or equivalent correspondence from Ivy Tech please provide it to the UK IRB.

Approval is effective from December 20, 2012 until December 19, 2013 and extends to any consent/assent form, cover letter, and/or phone script. If applicable, attached is the IRB approved consent/assent document(s) to be used when enrolling subjects. **[Note, subjects can only be enrolled using consent/assent forms which have a valid "IRB Approval" stamp unless special waiver has been obtained from the IRB.]** Prior to the end of this period, you will be sent a Continuation Review Report Form which must be completed and returned to the Office of Research Integrity so that the protocol can be reviewed and approved for the next period.

In implementing the research activities, you are responsible for complying with IRB decisions, conditions and requirements. The research procedures should be implemented as approved in the IRB protocol. It is the principal investigator responsibility to ensure any changes planned for the research are submitted for review and approval by the IRB prior to implementation. Protocol changes made without prior IRB approval to eliminate apparent hazards to the subject(s) should be reported in writing immediately to the IRB. Furthermore, discontinuing a study or completion of a study is considered a change in the protocol's status and therefore the IRB should be promptly notified in writing.

For information describing investigator responsibilities after obtaining IRB approval, download and read the document "PI Guidance to Responsibilities, Qualifications, Records and Documentation of Human Subjects Research" from the Office of Research Integrity's Guidance and Policy Documents web page [http://www.research.uky.edu/ori/human/guidance.html#resp]. Additional information regarding IRB review, federal regulations, and institutional policies may be found through ORI's web site [http://www.research.uky.edu/ori]. If you have questions, need additional information, or would like a paper copy of the above mentioned document, contact the Office of Research Integrity at (859) 257-9428.

M. Van Tuinen Ph.D/ah

Chairperson/Vice Chairperson

An Equal Opportunity University

Appendix D

Demographic Questionnaire, GRIT Scale and Pretest Measure

Q1. Please select all of the technology devices you frequently use:

Mobile Smart Phone	Mobile Tablet Device (tablet, iPad, Surface)
Personal Computer	MP3 player/iPod
Laptop	

Q2. Please select all of the ways you use technology:

Download Music/Apps	Word Processing/Typing
Gaming	Complete Homework Assignments
Access the news	Facebook
Gather Information/Research	Twitter
Listen to music	Pinterest
Watch videos	Blackboard
Email	Instagram
Read blogs	LinkedIn
Write blogs	Other
Shop	

Q 3. Please select all of the technologies you use for your classes:

Email	Blackboard
Word Processing/Productivity Software	I have not yet taken a college course
UK's Online Library Resources	Required Software (type name below)
Video	Other

Q 4. When using each of the following software programs and applications, check the statement that most accurately describes HOW MUCH HELP YOU NEED with each. Please mark N/A for programs that you have not used.

	I **often** need help	I **sometimes** need help	I **rarely** need help	I can **help other people**	N/A **I have not used** this program before
Games					
Word Processing (Ex. Microsoft Word)					
Spreadsheets (Ex. Microsoft Excel)					
Presentations (Ex. Microsoft PowerPoint)					
Computer Programming (Ex. C++, Java, Visual Basic)					
Databases (Ex. Microsoft Access, Zoho, etc.)					
Multimedia Development (Ex. Flash, HTML 5)					
Adobe Creative Suite					
Adobe Acrobat					

Adobe Reader

MovieMaker/iMovie

Internet

Web page design/creation (Wordpress, HTML, XML, etc.)

Blogs

Twitter

Facebook

Email

Instagram

Discussion Board

Blackboard or other LMS

AutoCAD

iTunes

iTunes U

Khan Academy

LinkedIn

Other _____

Q 5. Select the option that best describes how often you use a computer to complete the following tasks.

	Never	Once or twice a year	Monthly	Weekly	Daily	Several Times per Day
Games						
Word Processing (Ex. Microsoft Word)						
Spreadsheets (Ex. Microsoft Excel)						
Presentations (Ex. Microsoft PowerPoint)						
Computer Programming (Ex. C++, Java, Visual Basic)						
Databases (Ex. Microsoft Access)						
Multimedia Development (Ex. Flash)						
Adobe Creative Suite						
Adobe Acrobat						
Adobe Reader						
MovieMaker/iMovie						
Internet						
Web page design/creation (Wordpress, HTML, XML, etc.)						
Blogs						

Twitter

Facebook

Email

Instagram

Discussion Board

Blackboard or other LMS

AutoCAD

iTunes

iTunes U

Khan Academy

LinkedIn

Other

Q 6. When I have a question about my online coursework, I feel comfortable asking/consulting my (select all that apply):

Instructor

Advisor

IT Help Services

Family member(s)

Friends

Classmates

Internet resources

Other

Q 7. Which of these Student Services have you previously used or are currently using?

Academic Resources (tutoring, transfer advising, etc.)	Fitness Center
Advising	Student Involvement (student government, student clubs, peer groups, etc.
Career Services	IT Help Services
Counseling (behavioral, communication, and physical health issues, etc.)	I'm a new student and have **never** used any of these services.
Financial Resources (scholarships, financial aid, work study, etc.)	

Q 8 Which of these Student Services do you intend to use in the future.

Academic Resources (tutoring, transfer advising, etc.)	Fitness Center
Advising Services	Student Involvement (student government, student clubs, peer groups, etc.
Career Services	IT Help Services
Counseling (behavioral, communication, and physical health issues, etc.)	None
Financial Resources (scholarships, financial aid, work study, etc.)	

These next questions are about your preferences for learning and thinking about something new.

Q 9 Please indicate which most accurately describes how much you agree with each of the following statements:

	Very much like me	Like Me	Not like me	Not at all like me
New ideas and projects sometimes distract me from previous ones				
Setbacks don't discourage me				
I have been obsessed with a certain idea or project for a short time but later lost interest				
I am a hard worker				
I often set a goal but later choose to pursue a different one				
I have difficulty maintaining my focus on projects that take more than a few months to complete				

I finish whatever I

begin

I am diligent

The next set of questions are question about you. Please mark the response that best describes you.

Q 10 What is your current college status?

This is my first college course

Freshman-I have earned 1-29 credit hours

Sophomore- 30-59 earned credit hours

Junior- 60-89 earned credit hours

Senior-90-130+ earned credit hours

Graduate student

Q11 From what college are you pursuing a major?
[dropdown box]

Q12 Please enter the degree you are pursuing.

Q13 What is your overall GPA since enrolling at UK?

I don't have a GPA because this is my first semester.

Less than 1.0

1.0-1.4

1.5-1.9

2.0-2.4

2.5-2.9

3.0-3.4

3.5-3.9

4.0

Q14 After graduating from this institution, which of the following do you intend to do?

enter the workforce

immediately attend graduate school

other

Q15 What is your gender?

Male

Female

Other

Prefer not to answer

Q16 In what year were you born?

Q17 Do you own a personal computer or laptop?

Yes

No

Q18 What kind of Internet connection do you have? (Select all that apply.)

None

Dial-Up

DSL

Cable

Satellite

Wi-fi

Q 19 On average, about how much time <u>per week</u> do you spend using a computer on schoolwork?

Less than 1 hour

1-3 hours

4-6 hours

More than 6 hours

This is my first course.

Q 20 What best reflects the reason you signed up for an online class?

There wasn't an in-class version of this course.

I couldn’t attend class during the in-class times because of work or family commitments.

I prefer to take my classes online.

I am traveling this summer and can't take classes on campus

I am going home for the summer and can't take classes on campus

Other (please indicate the reason below)

Q 21 Please select the number of online courses you have previously taken

0, this is my first online course

1

2-3

4-5

6

Q 22 Have you dropped an online course for any reason?

Yes

No

Q23 Please indicate why you dropped the online course.

The next few questions are about the content in your course. You are not expected to know the answers. We will compare your results to a similar survey at the end of class to see what you learned during the class.

Q24 What LMS are you using for this course?

Blackboard

Canvas

Desire 2 Learn

Moodle

Q 25 Which tool is primarily used to communicate one's knowledge and opinions with *others?*

Discussion Board

Wiki

Journal

Blog

Q 26 Copying and pasting from the Internet can be done without citing the Internet page because everything on the Internet is common knowledge.

True

False

Q 27 How can you tell you are looking at a popular magazine? (Choose two)

Articles are written for the general public

Articles are in-depth and often have a bibliography

Issues have lots of photographs

Issues have few, if any, advertisements

Q 28 Harrison, Kristen and Joanne Cantor. "The Relationship between Media Consumption and Eating Disorders." Journal of Communication. 47 (Spring 1997) 40-67.

Scholarly source

Popular source

Q 29 Something is common knowledge if you knew it before you started the course or if it came from your own idea.

True

False

Q 30 Using a few phrases from an article and mixing them in with your own words is not plagiarism.

True

False

Q 31 When you summarize a block of text from another work, citing the source at the end of your paper is all you need to do.

True

False

Q 32 You are writing a paper about the migration of Africanized honey bees to the United States and you have found the following article:

"Flight of the Killer Bees." Newsweek, v. 117 no19 (Nov.14, 1994) p.25.

Would this be considered a scholarly journal article?

Yes

No

Q 33 If it is available, on the Internet, then it is free for you to use without concerns of copyright infringement.

True

False

Q 34 You can avoid plagiarizing by: (choose all that apply)

Using quotation marks when directly stating another person's words.

Using the ideas of other people sparingly and only to support your own argument.

Taking notes about your sources, including citation information for each source--even Web sources.

Writing a short draft of your paper in thirty minutes without using your notes.

Q 35 What is the recommended browser to use with your LMS?

Safari

Internet Explorer

Netscape

Mozilla Firefox

Q 36 What program do you need to install on your computer in order to view pdfs?

Adobe Flash

Adobe Reader

Java

Q 37 Did you know that you can download a copy of Microsoft Office 365 for free by being a student at this institution?

Yes

No

Q 38 What is the primary way course updates will be presented to you?

face-to-face

email

podcasts

facebook posts

tweets

Q 39 How often should you check your email?

Never

1-2 times a week

3-4 Times a Week

Daily

Every hour

Q 40 It is not necessary to save my work as it will all be in Blackboard.

True

False

Thank you for taking this survey. If you have any questions about the survey or how the data will be used, please contact Heather Arrowsmith at heather.arrowsmith@uky.edu.

Thank you for your time. Since you indicated you do not wish to participate in the study, you do not need to complete the survey.

Appendix E

Posttest

Thank you for taking this FINAL survey. The information you provide will be very helpful to the researchers. Please type your FIRST and LAST NAME in the box.

Q1 What LMS are you using for this course?
Blackboard
Canvas
Desire 2 Learn
Moodle

Q2 Eyers, H. (2015, May 15). Vienna's traditional coffee houses still hum with intellectual productivity. Newsweek. Retreived from http://europe.newsweek.com/viennas-traditional-coffee-houses-still-hum-intellectual-productivity-327251.Would this be considered a scholarly journal article?
Yes
No

Q3 Guskey, T. R. (1988). Improving student learning in college classrooms. Springfield, IL: Charles C. Thomas. Would this be considered a scholarly journal article?
Yes
No

Q4 Because the Internet is free, you can download and use anything on it.
True
False

Q5 Something is common knowledge if it is something most people know.
True
False

Q6 You don't need to credit someone's ideas as long as you change some of their words.
True
False

Q7 When you summarize a block of text from another work, citing the source at the end of your paper is all you need to do.
True
False

Q8 You can avoid plagiarizing by: (choose all that apply)
Using quotation marks when directly stating another person's words.
Using the ideas of other people sparingly and only to support your own argument.
Taking notes about your sources, including citation information for each source--even Web sources.
Writing a short draft of your paper in thirty minutes without using your notes.

Q9 What is the recommended browser to use with your LMS?
Safari
Internet Explorer
Netscape
Mozilla Firefox

Q10 Which of the following programs do you need to install on your computer in order to view pdfs?
Adobe Flash
Adobe Reader
Java

Q11 Did you know that you can download a copy of Microsoft Office 365 for free by being a UK student?
Yes
No

Q12 It is not necessary to save my work as it will all be stored in Blackboard.
True
False

Q13 What is the primary way course updates/announcements will be presented to you?
face-to-face
email
podcasts
facebook posts
tweets

Q14 How often should you check your email?
Never
1-2 times a week
3-4 Times a Week
Daily
Every hour

Q15 In Unit A: Computer Basics, did you make updates to your computer at that time?
Yes
No

Q16 In Unit A: Computer Basics, did you download Microsoft Office 365 for free from UK?
Yes, I downloaded it at that time
No, I already had Microsoft Office 365 on my computer
No, I will download it at another time
Other _____

Q17 In Unit B: Online Course Basics did you download the Blackboard Mobile App for a mobile device?
Yes
No

Q18 How often have you check your email during your online course?
Never
1-2 times a week
3-4 times a week
daily
multiple times a day

Q19 Please select the most appropriate response for each activity. I found completing the _____ in the mini-course BEFORE completing a discussion board for a grade in my online course to be...

	Not at all Helpful	Not very helpful	Somewhat helpful	Very Helpful
Discussion Board				
Practice Tests/Quiz				
Use Library Resources				

Q20 Please provide information about why you found the previous activities not helpful. Your response will help the researchers design a class to meet the needs of students.

Q21 During your online class, have you used any of the following student resources? Select all that apply.
The Study: http://www.uky.edu/AE/home
CATS: http://catsacademics.com
The Writing Center: http://wrd.as.uky.edu/writing-center
The Math Resource Center: http://www.mathskeller.com
Khan Academy
iTunesU

Q22 Please rate the degree to which...

	Not at all	A little	Somewhat	A Lot
YOU benefited from this course				
you think OTHERS would benefit from this course				

Q23 What element(s) of the course did you find most beneficial?

Q24 What element(s) of the course did you find least helpful?

Q25 Please add any additional comments.

Q26 You have completed all of the requirements of this course. Thank you SO much for participating in this study! The information collected about your online course experience will help the researchers find ways to improve the online course experiences for future students!

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Vita

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EDUCATION

University of Kentucky, Lexington, Kentucky, December 2011
Distance Education Graduate Certificate, Instructional Systems Design emphasis

University of Kentucky, Lexington, Kentucky, December 2005
Master of Science in Education, Instructional Systems Design, Computer Science Endorsement

Marshall University, Huntington, West Virginia, May 2001
Bachelor of Arts in Education, Elementary Education Major (K-8), Minor in History

PUBLICATIONS

Arrowsmith, H. E., Cole, H. P., Mazur, J. M. (2009). A Spanish language narrative simulation to prevent horseback riding head injury among rural youth. *Health Education Journal, 68, 63-74.*

Cole, H.P., Piercy, L.R., Heinz, K.L., Westneat, S.C., Arrowsmith, H.E., Raymond K.M. (2009). Safety status of farm tractors that operate on public highways in four rural Kentucky counties. *Journal of Agricultural Safety and Health, 15*(3), 207-223.

PRESENTATIONS/WORKSHOPS

2016 Sampson, S.O., Arrowsmith, H.E., Bradley, K. D., Mensah, R.K. *Using an Online Learning Course to Increase Retention and Enhance Experiences in an Online Program.* AERA 2016, Washington, D.C.

2012 **An Analysis of Trends and Issues in Four Instructional Technology Journals.** Association for Educational Communications and Technology-Louisville, KY; C. Daniel, H.E. Arrowsmith, G.J. Anglin, K. Silvey, J. Watson , A. McFarland, S.Pittman

2011 **Constructing a Measure to Determine Potential Impacts of Instructors' First-time Online Instruction on Technology Usage for Face-to-Face Instruction.** Midwest Education Research Association-St. Louis, MO.; H. E. Arrowsmith, K.D. Bradley

2010 **Learn Podcasting! Skills & Products for Instruction & Assessment** NAAE – Las Vegas, NV; J.M. Mazur, K. Swan, H.E. Arrowsmith

CERTIFICATION

State of Indiana Professional Educator's License-Instructional: Accomplished Practitioner for the following content areas and school settings:

Elementary/Primary Generalist	Elementary/Primary
Elementary/Intermediate Generalist	Elementary/Intermediate
Computer Education	All Schools

Commonwealth of Kentucky Education Professional Standards Board Certificate for Teachers and other Professional School Personnel for the following areas:

Professional Certificate for Teaching In Elementary School, Primary through Grade 5.

Endorsement for Teaching Instructional Computer Technology, Primary through Grade 12.

PROFESSIONAL EXPERIENCE

2014-present HENSON GROUP, LLC
CONSULTANT

2013-Sept 2014 HUMANA
LEARNING CONSULTANT

2012-2013 IVY TECH COMMUNITY COLLEGE-SOUTHWEST
DIRECTOR OF INSTRUCTIONAL AND ONLINE TECHNOLOGIES

2010-2012 UNIVERSITY OF KENTUCKY, COLLEGE OF ARTS AND SCIENCES
INSTRUCTIONAL DESIGNER-GRADUATE ASSISTANT
TEACHING ASSISTANT

2006-2011 IVY TECH COMMUNITY COLLEGE-SOUTHWEST
ADJUNCT PROFESSOR (May 2010-Dec. 2011)
PROGRAM CHAIR OF EDUCATION (May 2008-May 2010)
ASSISTANT PROFESSOR (May 2008-May2010)
INSTRUCTOR/FACULTY FELLOW (Aug.2006-May 2008)
PHI THETA KAPPA FACULTY ADVISOR-June 2007-May 2009

2004-2006 UNIVERSITY OF KENTUCKY
RESEARCH COORDINATOR
TEACHING ASSISTANT

2005 LEXINGTON COMMUNITY COLLEGE
ADJUNCT INSTRUCTOR, Lexington Community College, Spring 2005

2001-2004 FAYETTE COUNTY PUBLIC SCHOOLS
PRIMARY TEACHER, Aug. 2001-May 2004

COLLEGE/COMMUNITY SERVICE

Member of the Highland Elementary PL 221/School Community Site Council (Evansville, IN)

Former Co-Chair of the Learning Centered Team at Ivy Tech Community College-This committee evaluates institutional research in order to determine areas of need and create a professional development calendar for the college.

Member of various pilot programs within the University of Kentucky online education community

Former Member of the Faculty Council at Ivy Tech Community College-This committee handles faculty issues as well as conducts interviews and selects a recipient for the annual President's Award for Instructional Excellence.

Former Member of the Harwood Middle School PL 221/School Community Site Council (Evansville, IN)